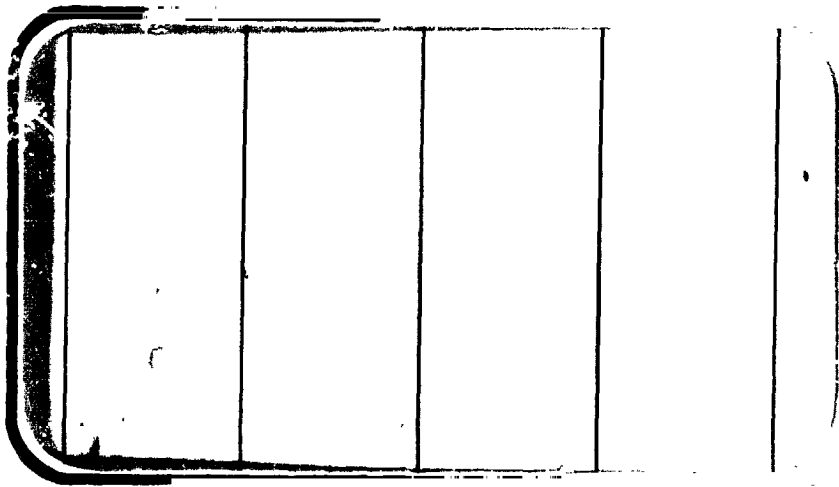


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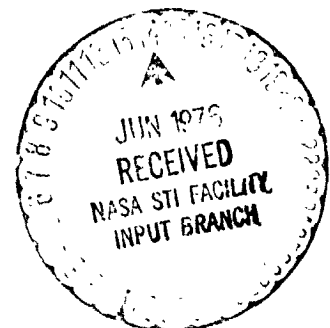
(NASA-CR-144608) AEROCHEATING (PRESSURE)
CHARACTERISTICS ON A C.010-SCALE VERSION OF
THE VEHICLE 3 SPACE SHUTTLE CONFIGURATION
(26-OTS) IN THE LANGLEY RESEARCH CENTER
4-FOOT WIND TUNNEL (IB4), VOLUME 1

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SPACE SHUTTLE

AEROTHERMODYNAMIC DATA REPORT



JOHNSON SPACE CENTER

HOUSTON, TEXAS

DATA Management services

SPACE DIVISION



**CHRYSLER
CORPORATION**

May, 1976

DMS-DR-2138
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VOLUME 1 OF 4

AEROHEATING (PRESSURE) CHARACTERISTICS ON A
0.010-SCALE VERSION OF THE VEHICLE 3 SPACE SHUTTLE
CONFIGURATION (26-OTS) IN THE LANGLEY RESEARCH CENTER
4-FOOT WIND TUNNEL (IH4)

by

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Prepared under NASA Contract Number NAS9-13247

by

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National Aeronautics and Space Administration
Houston, Texas

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AEROHEATING (PRESSURE) CHARACTERISTICS ON A
0.010-SCALE VERSION OF THE VEHICLE 3 SPACE SHUTTLE
CONFIGURATION (26-OTS) IN THE LANGLEY RESEARCH CENTER
4-FOOT WIND TUNNEL (IH4)

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R. B. Kingsland
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ABSTRACT

This report presents the results of wind tunnel tests, IH4, conducted at the Langley Research Center Unitary Plan Wind Tunnel. The model tested was an 0.010-scale version of the Vehicle 3 Space Shuttle Configuration. Pressure measurements were made on the launch configuration, Orbiter alone, external tank alone, and solid rocket booster alone, to provide heat transfer pressure data.

The tests were conducted for a Mach number range from 2.36 to 4.6 and Reynolds number range from 1.2 to 5×10^6 per foot. The model was tested at angles of attack from -10° to 20° for a sideslip angle range from -5° to $+5^\circ$, and at sideslip angles from -5° to 48° for 0° angle of attack.

This report for IH4 consists of four volumes:

Volume 1 - data figures 4 through 47

Volume 2 - data figures 48 through 92

Volume 3 - tabulated source data, pages 1-401 (R data sets)

Volume 4 - tabulated source data, pages 402-926 (M and A data sets).

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- B) C_p/C_{pstag} versus X/C_W
- C) C_p/C_{pstag} versus X/C_v
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- J) P_i/P_u versus X/L_{SRB} ; P_i/P_u versus ψ

NOMENCLATURE

<u>PLOT SYMBOL</u>	<u>MNEMONIC</u>	<u>DEFINITION</u>
a		speed of sound, ft/sec
A _b		base area, ft ²
b	BREF	wing span or reference span, in
c.g.		center of gravity
l _{ref} \bar{c}	LREF	reference length or wing mean aerodynamic chord, in
C	C	local wing chord, in
C _p	CP	local pressure coefficient; $(P_n - P_\infty)/q$
C _{pstag}	CPSTG	stagnation pressure coefficient
C _p /C _{pstag}	CP/CPS	ratio of local static pressure coefficient to stagnation pressure coefficient
	CONFIG	configuration
	F.S.	fuselage station, in
	I.V.	integrated vehicle
L	L	actual length of component, in
MACH	MACH	Mach number, V/a
	M.S.	missile station, in
P _l	PL	local static pressure; $1/2\rho v^2$, psi
	POINT	data point number
P _∞	PINF	freestream static pressure, psi
P _i /P _u	PI/PU	interference to undisturbed pressure ratio
P _l /P _∞	PR	ratio of local static pressure to freestream static pressure



NOMENCLATURE (Continued)

<u>PLOT SYMBOL</u>	<u>MNEMONIC</u>	<u>DEFINITION</u>
	PORT	Scanivalve port number
	RUN	run number
RN/L	RN/L	unit Reynolds number, per ft
	S-V VALVE	Scanivalve number
q	Q(Psi)	dynamic pressure; $1/2\rho v^2$, psi
	SREF	wing area or reference area, ft ²
	MRP	moment reference point
	XMRP	moment reference point on X axis, in
	YMRP	moment reference point on Y axis, in
	ZMRP	moment reference point on Z axis, in
T	T	temperature, °F
V	V	velocity, ft/sec
X/L _b	X/LB	distance from nose of orbiter divided by orbiter length
X/L _T	X/LT	distance from external tank nose divided by external tank length
X/L _{SRB}	X/LSRB	distance from SRB nose divided by SRB length
X/C _w	X/CW	distance from wing leading edge divided by wing chord length
X/C _v	X/CV	distance from vertical tail leading edge divided by vertical tail chord length
X	X	longitudinal distance from nose of component, in

NOMENCLATURE (Continued)

<u>PLOT SYMBOL</u>	<u>MNEMONIC</u>	<u>DEFINITION</u>
Y	Y	lateral distance from center-line of component, in
Y/b/2	2Y/BW	distance from fuselage center-line outboard divided by semi-span length
Z	Z	vertical distance from reference plane of component, in
Z/bv	Z/BV	distance from orbiter station $Z_0 = 500$ divided by vertical tail span
α	ALPHA	angle of attack, deg
β	BETA	angle of sideslip, deg
ψ	PSI	SRB ray angle measured clockwise, looking forward, from bottom center-line, deg
ϕ	PHI	orbiter ray angle measured clockwise, looking forward, from bottom center-line, deg
θ	THETA	external tank ray angle measured clockwise, looking forward, from bottom center-line, deg
ρ	RHO	mass density, slugs/ft ³
μ	MU	freestream viscosity, lb-sec/ft ⁴

SUBSCRIPTS

	o	SSV reference system
	1	conditions upstream of a shock wave
	2	conditions downstream of a shock wave
b	B	body
	FS	fuselage station, in

NOMENCLATURE (Concluded)

SUBSCRIPTS (Continued)

<u>PLOT SYMBOL</u>	<u>MNEMONIC</u>	<u>DEFINITION</u>
	FULL	full scale
i	I	interference-integrated vehicle data
	LE	leading edge
l	L	local
	MS	missile station, in
n	ORI NO	orifice number, n = integer
O	O	Orbiter
S SRB	SRB	Solid Rocket Booster
s		static conditions
stag	S	stagnation conditions
T	T	external tank
t		total conditions
u	U	undisturbed-component alone data
v	V	vertical tail
W	W	wing
∞		freestream

CONFIGURATIONS INVESTIGATED

- (1) $O_1 + T_{15} + S_8 N_{16}$ - Integrated Vehicle

O_1 = Orbiter - B_{17} C_7 M_4 F_5 W_{103} E_{22} V_7 R_5

B_{17} - Fuselage

C_7 - Canopy

M_4 - OMS Pods

F_5 - Body Flap

W_{103} - Wing

E_{22} - Elevon

V_7 - Vertical Tail

R_5 - Rudder

T_{15} = External Tank with protuberances

S_8 = Solid Rocket Booster

N_{16} = BSRM nozzles

- (2) $O_1 + T_{22} + S_8 N_{16}$ - Integrated Vehicle

T_{22} = External Tank without protuberances

- (3) O_1 - Orbiter

- (4) T_{15} - External Tank Alone

- (5) $S_8 N_{16}$ - Solid Rocket Booster Alone

TEST FACILITY DESCRIPTION

The NASA LaRC 4 foot Unitary Plan Wind Tunnel (UPWT) is a closed-circuit, continuous flow, variable density facility. The test section is 4 feet by 4 feet by 7 feet long.

Two tunnel legs are available for supersonic testing in the Mach number ranges 1.47 to 2.86 (Leg No. 1) and 2.29 to 4.63 (Leg No. 2). All of these tests were made in Leg No. 2. An asymmetric, sliding block nozzle position and total pressure setting provide the test Mach numbers at a specified Reynolds number. Reynolds number can be varied from 0.76 to 7.78 million per foot. Available stagnation pressure variation is 4.0 to 142. psia. Dynamic pressure variation is 95. to 1260. psf with normal operating stagnation temperature about 150°F in Mach modes 2 or 3 and about 175°F in Mach mode 4. The tunnel is equipped with a dry air supply, an evacuating system, and a cooling system. The facility power is approximately 83,000 horsepower.

Model mounting provisions consist of various sting arrangements, including axial (longitudinal), lateral (independent pitch and yaw), and roll movement with side wall support. A Schlieren system and oil flow visualization equipment are available. Data are recorded at the tunnel and reduced off-line at the Langley Computer Center. The tunnel is used for force and moment, pressure, and dynamic stability tests. Hot and cold jet effects and heat transfer have been studied in the UPWT.

TESTING AND PROCEDURE

Before model installation, each of the 341 model orifices were checked for leaks and continuity. The location of each of the orifices on the model is presented in Table 4. It was found during this check that orifices 43, 738, and 766 were open and that orifices 121, 532, 553, 558, 590, and 715 were plugged. Of these, only orifice 43 was recorded during the tests.

During model installation, the good orifices were connected to twelve Scanivalves as indicated in Tables 5 and 6. A system leak and continuity check was made at this time and all orifices were reading good except 701 which was plugged after data point 104. No further checks were made because none of these connections were broken during the test.

A vacuum was connected to port 0 and a 1 psi reference pressure to ports 1 and 2 of each Scanivalve. Additional reference pressures of 5 psi were connected to the first two ports that were open after all model pressures were recorded on each Scanivalve. On the Scanivalves that used 10 psi transducers, the next two ports had a 10 psi reference pressure connection. The vacuum was used as a zero point in data reduction and the reference pressures were used as a check on the transducer calibrations during running, and, if necessary, to adjust the pretest calibration of the transducers. To increase the accuracy of the data, the transducers used in each of the twelve Scanivalves were arranged by pressure range depending on which configuration was being tested and on estimated pressure measurement levels. The actual transducer range used in each Scanivalve is presented in Table 7. After each transducer change, a check was made to ensure that there were no leaks.

DATA REDUCTION

Standard Langley Research Center methods were used to obtain local static pressures in psi, P_n .

The local static pressure coefficient for each orifice was calculated by:

$$C_{p_n} = (P_n - P_1)/q_1$$

The ratios of local static pressure to freestream static pressure upstream of the shock wave were calculated by:

$$PR_1 = P_n/P_1$$

The ratios of local static pressure to total pressure downstream of the shock wave were calculated by:

$$PR_2 = P_n/P_{t2}$$

The stagnation pressure coefficients were calculated by:

$$C_{p_{stag}} = (P_{t2} - P_1)/q_1$$

The ratios of local static pressure coefficient to stagnation pressure coefficient were calculated by:

$$C_{p_n}/C_{p_{stag}} = (P_n - P_1)/(P_{t2} - P_1)$$

If the data was from a component alone run, this equation provided the ratio of local static pressure coefficient undisturbed to stagnation pressure coefficient, $C_{p_u}/C_{p_{stag}}$. However, if the data was from an integrated component run, this equation provided the ratio of local static pressure coefficient interference to stagnation pressure coefficient, $C_{p_i}/C_{p_{stag}}$.

DATA REDUCTION (Concluded)

The ratios of local static pressure interference to local static pressure undisturbed were calculated by:

$$P_i/P_u = (P_{n1} - P_1)/(P_{nu} - P_1)$$

TABLE I.

TEST : IH ₄		DATE : 11/12/73	
TEST CONDITIONS			
MACH NUMBER	REYNOLDS NUMBER (per ft x 10 ⁶)	DYNAMIC PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Fahrenheit)
2.36	1.2	1.87	150
2.36	3.0	4.67	150
2.95	1.2	1.62	150
2.95	3.0	4.04	150
2.95	5.0	6.73	150
3.7	1.2	1.26	150
3.7	3.0	3.15	150
3.7	5.0	5.26	150
4.6	1.2	0.98	175
4.6	3.0	2.45	175
4.6	5.0	4.09	175
BALANCE UTILIZED: <u>NONE</u>			
	CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE:
NF	_____	_____	_____
SF	_____	_____	_____
AF	_____	_____	_____
PM	_____	_____	_____
RM	_____	_____	_____
YM	_____	_____	_____
COMMENTS: Pressure Transducers accuracy $\pm 1\%$ of rated load.			
21			

DATE: 3/31/76 (REVISED)

L = LOWER WING
V = VERTICAL TAIL
T = EXTERNAL TANK
S = SOLID ROCKET BOOSTER

TABLE II. (Continued).

TEST: JH-4 (UPWT 1034)				DATA SET/POINT NUMBER COLLATION SUMMARY										DATE: 3/31/76 (REVISED)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
DATA SET IDENTIFIER	CONFIGURATION	SCMD.		PARAMETERS/VALUES		NO. OF PTS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)						TEST RUN NUMBERS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
		α	β	Rw/L								2.36	2.75	3.7	4.6																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													

DATE: 3/31/76 (REVIS#)

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ORIGINAL PAGE IS POOR**

TABLE II. (Continued).

DATE SET/ROW NUMBER COLLATION SUMMARY										DATE: 3/31/76 (REVISED)											
DATA SET IDENTIFIER		CONFIGURATION		SCHD. PARAMETERS/VALUES		NO. OF PYS		MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)				TEST RUN NUMBERS									
				α β RN/L				2.36 2.95 3.7 4.6													
RG3SEA		(*) S8 N16		0 -5 1.2		1															
		(SRB ALONE)		0 0 1.2		2		141													
				0 5 1.2		2		142 168													
				0 -5 3.0		2		143 169													
				0 0 3.0		2		144 156													
				0 5 3.0		2		145 157													
				0 10 3.0		2		146 158													
				0 0 5.0		2		147 159													
				0 5 5.0		2		154 166													
				0 -5 3.0		2		155 167													
				0 0 3.0		2		148 160													
				0 5 3.0		2		145 187													
				0 10 3.0		2		149 161													
				0 20 3.0		2		150 162													
				0 40 3.0		2		151 163													
				0 48 3.0		2		152 164													
						2		153 165													

TABLE II. - (Concluded).

RESULTANT DATA SET	DATA SET/DATA SET
AQ3BAA	MQ3BAA/MQ3BCA
AQ3UAA	MQ3UAA/MQ3UCA
AQ3LAA	MQ3LAA/MQ3LCA
AQ3VAA	MQ3VAA/MQ3VCA
AQ3TAA	MQ3TAA/MQ3TDA
AQ3SAA	MW3SAA/MQ3SEA
AQ3BAB	MQ3BAB/MQ3BCB
AQ3UAB	MW3UAB/MQ3UCB
AQ3LAB	MQ3LAB/MQ3LCB
AQ3VAB	MQ3VAB/MQ3VCB
AQ3TAB	MQ3TAB/MQ3TDB
AQ3SAB	MQ3SAB/MQ3SEB
AQ3BAC	MQ3BAC/MQ3BCC
AQ3UAC	MQ3UAC/MQ3UCC
AQ3LAC	MQ3LAC/MQ3LCC
AQ3VAC	MQ3VAC/MQ3VCC
AQ3TAC	MQ3TAC/MQ3TDC
AQ3SAC	MQ3SAC/MQ3SEC
AQ3BAD	MQ3BAD/MQ3BCD
AQ3UAD	MW3UAD/MQ3UCD
AQ3LAD	MQ3LAD/MQ3LCD
AQ3VAD	MQ3VAD/MQ3VCD
AQ3BAE	MQ3BAE/MQ3BCA
AQ3UAE	MQ3UAE/MQ3UCE
AQ3LAE	MQ3LAE/MQ3LCE
AQ3VAE	MQ3VAE/MQ3VCE

TABLE III. - MODEL DIMENSIONAL DATA

MODEL COMPONENT : BODY - B₁₇

GENERAL DESCRIPTION : Diselage, 3 Configuration, Lightweight Orbiter
per Rockwell Lines VL70-000139.

MODEL SCALE: 0.010

DRAWING NUMBER VL70-000139

DIMENSIONS :

FULL SCALE

MODEL SCALE

Length - In.

1290.3

12.903

Max Width - In.

267.6

2.676

Max Depth - In.

244.5

2.445

Fineness Ratio

4.82175

4.82175

Area - Ft²

Max. Cross-Sectional

386.67

0.03867

Planform

Wetted

Base

TABLE III. - Continued.

MODEL COMPONENT : CANOPY - C₇

GENERAL DESCRIPTION : Configuration 3 per Rockwell Lines

VL70-000139.

MODEL SCALE: 0.010

DRAWING NUMBER VL70-000139

DIMENSIONS	FULL SCALE	MODEL SCALE
Length ($X_0=433$ to $X_0=670$) in.FS	<u>237.0</u>	<u>2.37</u>
Max Width	<u> </u>	<u> </u>
Max Depth	<u> </u>	<u> </u>
Fineness Ratio	<u> </u>	<u> </u>
Area	<u> </u>	<u> </u>
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

TABLE III. - Continued.

MODEL COMPONENT: ELEVON - E₂₂GENERAL DESCRIPTION: 3 Configuration per W₁₀₃ Rockwell LinesVL70-000139 data for (1) of (2) sides.Model scale: 0.010DRAWING NUMBER: VL70-000139

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Area - Ft ²	<u>205.52</u>	<u>0.02055</u>
Span (equivalent) - In.	<u>353.34</u>	<u>3.5334</u>
Inb'd equivalent chord	<u>114.78</u>	<u>1.1478</u>
Outb'd equivalent chord	<u>55.00</u>	<u>0.550</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u>0.208</u>	<u>0.208</u>
At Outb'd equiv. chord	<u>0.400</u>	<u>0.400</u>
Sweep Back Angles, degrees		
Leading Edge	<u>0.00</u>	<u>0.00</u>
Trailing Edge	<u>- 10.24</u>	<u>- 10.24</u>
Hingeline	<u>0.00</u>	<u>0.00</u>
Area Moment (Normal to hinge line) - Ft ³	<u>1548.07</u>	<u>0.00155</u>

TABLE III. - Continued.

MODEL COMPONENT : BODY FLAP - F₅

GENERAL DESCRIPTION : 3 Configuration per Rockwell Lines

VL70-000139

MODEL SCALE: 0.010

DRAWING NUMBER : VL70-000139

DIMENSIONS :	FULL SCALE	MODEL SCALE
Length - In.	<u>84.70</u>	<u>0.8470</u>
Max Width - In.	<u>267.6</u>	<u>2.676</u>
Max Depth	<u> </u>	<u> </u>
Fineness Ratio	<u> </u>	<u> </u>
Area - Ft ²	<u> </u>	<u> </u>
Max. Cross-Sectional	<u> </u>	<u> </u>
Planform	<u>140.00</u>	<u>0.0140</u>
Wetted	<u> </u>	<u> </u>
Base	<u>38.0958</u>	<u>0.00380</u>

TABLE III. - Continued.

MODEL COMPONENT: ONS Pods - "

GENERAL DESCRIPTION: Configuration 3 per Rockwell Lines VL70-000139.

NOTE: M4 identical to M3, except intersection to fuselage.

Model Scale = 0.010

DRAWING NUMBER VL70-000139

<u>DIMENSION:</u>	<u>FULL SCALE</u>	<u>MODEL SCALE</u>
Length - IN	<u>346.0</u>	<u>3.460</u>
Max Width - IN	<u>108.0</u>	<u>1.080</u>
Max Depth - IN	<u>113.0</u>	<u>1.130</u>
Fineness Ratio	<u> </u>	<u> </u>
Area - FT ²	<u> </u>	<u> </u>
Max Cross-Sectional	<u> </u>	<u> </u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

TABLE III. - Continued.

MODEL COMPONENT: BSRM NOZZLES - N₁₆GENERAL DESCRIPTION: 3 Configuration BSRM Nozzles per Rockwell LinesVL77-000036 and VL72-000088, Data for (1) of (2) sidesModel Scale = 0.010DRAWING NO. VL72-000088
VL77-000036

DIMENSIONS	FULL-SCALE	MODEL SCALE
MACH NO. _____		
DIAMETER DEX ~ IN ($\odot X_T = 1941$)	<u>178.5</u>	<u>1.785</u>
DIAMETER DT ~ IN	<u> </u>	<u> </u>
DIAMETER DIN ~ IN	<u> </u>	<u> </u>
ON ~ DEGREES	<u> </u>	<u> </u>
AREA - FT ²		
MAX CROSS-SECTIONAL	<u>173.78</u>	<u>0.01738</u>
GIMBAL ORIGIN	<u>X₀</u>	<u>Y₀</u> <u>Z₀</u>
LEFT NOZZLE ~ IN FS	<u>1738</u>	<u>-243</u> <u>400</u>
RIGHT NOZZLE ~ IN FS	<u>1738</u>	<u>+243</u> <u>400</u>
NULL POSITION	<u>PITCH</u>	<u>YAW</u>
LEFT NOZZLE - DEG.	<u>+8°</u>	<u>+8°</u>
RIGHT NOZZLE - DEG	<u>+8°</u>	<u>+8°</u>

TABLE III. - Continued.

MODEL COMPONENT: RUDDER - R₅

GENERAL DESCRIPTION: Configuration 140A/B Orbiter Rudder.

MODEL SCALE: 0.010

MODEL DRAWING No.: SS-A00148 RELEASE 6

DRAWING NUMBER: VL70-000146A

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Area - Ft ²	<u>106.38</u>	<u>.0106</u>
Span (equivalent) - In.	<u>201.0</u>	<u>2.010</u>
Inb'd equivalent chord - In.	<u>91.585</u>	<u>0.916</u>
Outb'd equivalent chord	<u>50.833</u>	<u>0.508</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u>0.400</u>	<u>0.400</u>
At Outb'd equiv. chord	<u>0.400</u>	<u>0.400</u>
Sweep Back Angles, degrees		
Leading Edge	<u>34.83</u>	<u>34.83</u>
Tailing Edge	<u>26.25</u>	<u>26.25</u>
Hingeline	<u>34.83</u>	<u>34.83</u>
Area Moment (Normal to hinge line)-Ft ³	<u>526.13</u>	<u>0.0005</u>

TABLE III. - Continued.

MODEL COMPONENT : BOOSTER SOLID ROCKET MOTOR - Sg

GENERAL DESCRIPTION : Booster Solid Rocket, 3 Configuration, Body
of Revolution, Data for (1) of (2) sides, per Rockwell Lines VL77-000036
and VL72-000088

MODEL SCALE: 0.010

DRAWING NUMBER VL72-000088, VL77-000036

DIMENSIONS :	FULL SCALE	MODEL SCALE
Length (Includes Nozzle) - In.	<u>1741.0</u>	<u>17.410</u>
Max Width (Tank Dia.) - In.	<u>142.0</u>	<u>1.420</u>
Max Depth (Aft Shroud) - In.	<u>205.0</u>	<u>2.050</u>
Fineness Ratio	<u>8.49268</u>	<u>8.49268</u>
Area - Ft ²	<u> </u>	<u> </u>
Max. Cross-Sectional	<u>229.21</u>	<u>0.02292</u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>
WP of BSRM Centerline (Z_T) - In.	<u>400.0</u>	<u>4.00</u>
FS of BSRM Nose (X) - In.	<u>200.0</u>	<u>2.00</u>

TABLE III. - Continued.

MODEL COMPONENT: External tank with protuberances, T15GENERAL DESCRIPTION: External oxygen-hydrogen tank; vehicle 3 configuration
per Rockwell lines VL78-000041B and VL72-000088B. Model Scale = 0.010DRAWING NUMBER: VL78-000041B
VL72-000088B

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length - In. (Nose $X_T=309$)	<u>1865</u>	<u>18.65</u>
Max. Width (Dia.)-In.	<u>324</u>	<u>3.24</u>
Max. Depth	<u>-</u>	<u>-</u>
Fineness Ratio	<u>5.756</u>	<u>5.756</u>
Area - FT^2		
Max. Cross-Sectional	<u>572.555</u>	<u>0.057</u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>
WP of Tank Centerline (X_T) In.	<u>400.0</u>	<u>4.000</u>

TABLE III. - Concluded.

MODEL COMPONENT: External Tank without protuberances, T22GENERAL DESCRIPTION: External Oxygen-Hydrogen Tank, Vehicle 3 configuration,
per Rockwell lines VL78-000041B and VL72-000088BModel Scale = 0.010DRAWING NUMBER:VL78-000041B
VL72-000088BDIMENSIONS:FULL-SCALEMODEL SCALELength - In. (Nose @ $X_T=309$)186518.65

Max. Width (Dia.)-In.

3243.24

Max. Depth

--

Fineness Ratio

5.7565.756Area - FT^2

Max. Cross-Sectional

572.5550.057

Planform

Wetted

Base

WP of Tank Centerline (X_T) In.400.04.000

TABLE III. - Continued.

MODEL COMPONENT: VERTICAL - V₇GENERAL DESCRIPTION: Centerline vertical tail, doublewedge airfoil with rounded leading edge.NOTE: Same as V5, but with manipulator housing removed.MODEL SCALE: 0.010DRAWING NUMBER: VL70-000139DIMENSIONS: FULL SCALE MODEL SCALE

TOTAL DATA

Area (Theo) - Ft ²		
Planform	<u>425.92</u>	<u>0.04259</u>
Span (Theo) - In.	<u>315.72</u>	<u>3.1572</u>
Aspect Ratio	<u>1.675</u>	<u>1.675</u>
Rate of Taper	<u>0.507</u>	<u>0.507</u>
Taper Ratio	<u>0.404</u>	<u>0.404</u>
Sweep-Back Angles, Degrees.		
Leading Edge	<u>45.000</u>	<u>45.000</u>
Trailing Edge	<u>26.249</u>	<u>26.249</u>
0.25 Element Line	<u>41.130</u>	<u>41.130</u>
Chords:		
Root (Theo) WP	<u>268.57</u>	<u>2.6850</u>
Tip (Theo) WP	<u>108.47</u>	<u>1.0847</u>
MAC	<u>194.81</u>	<u>1.9981</u>
Fus. Sta. of .25 MAC	<u>1463.50</u>	<u>14.635</u>
W.P. of .25 MAC	<u>635.522</u>	<u>6.35522</u>
B.L. of .25 MAC	<u>0 0.00</u>	<u>0.00</u>
Airfoil Section		
Leading Wedge Angle - Deg.	<u>10.000</u>	<u>10.000</u>
Trailing Wedge Angle - Deg.	<u>14.920</u>	<u>14.920</u>
Leading Edge Radius	<u>2.000</u>	<u>0.020</u>
Void Area - Ft ²	<u>13.17</u>	<u>0.00132</u>
Blanketed Area	<u>0.00</u>	<u>0.00</u>

TABLE III. - Continued.

MODEL COMPONENT: WING-W₁₀₃GENERAL DESCRIPTION: Configuration 3 Orbiter per Lines VL70-000139.NOTE: Same planform as W₀₇, except dihedral at Trailing Edge.MODEL SCALE: 0.010

TEST NO. _____

DWG. NO. VL70-000139DIMENSIONS:FULL-SCALEMODEL SCALETOTAL DATAArea (Theo.) Ft^2

Planform

2690.000.2690

Span (Theo.) In.

936.689.3668

Aspect Ratio

2.2652.265

Rate of Taper

1.1771.177

Taper Ratio

0.2000.200

Dihedral Angle, degrees

3.5003.500

Incidence Angle, degrees

3.0003.000

Aerodynamic Twist, degrees

+ 3.000+ 3.000

Sweep Back Angles, degrees

Leading Edge

45.00045.000

Trailing Edge

- 10.24- 10.24

0.25 Element Line

35.20935.209Chords:

Root (Theo) B.P.O.O.

689.246.8924

Tip, (Theo) B.P.

137.851.3785

MAC

474.814.7481

Fus. Sta. of .25 MAC

1136.8911.3689

W.P. of .25 MAC

299.202.9920

B.L. of .25 MAC

182.131.8213EXPOSED DATAArea (Theo) Ft^2 1752.290.1752

Span, (Theo) In. BP108

720.687.2068

Aspect Ratio

2.0582.058

Taper Ratio

0.24510.2451Chords

Root BP108

562.405.6240Tip 1.00 $\frac{b}{2}$ 137.851.3785

MAC

393.033.9303

Fus. Sta. of .25 MAC

1185.3111.8531

W.P. of .25 MAC

300.203.0020

B.L. of .25 MAC

251.762.5176Airfoil Section (Rockwell Mod NASA)
XXXX-64Root $\frac{b}{2}$ =0.100.10Tip $\frac{b}{2}$ =0.120.12

Data for (1) of (2) Sides

Leading Edge Cuff

Planform Area Ft^2 120.330.01203

Leading Edge Intersects Fus M. L. @ Sta

560.05.600

Leading Edge Intersects Wing @ Sta

1035.010.350

TABLE IV. - ORIFICE LOCATIONS.

26-OTS Orbiter

LREF = 1290.3

Pressure Tap Locations
Bottom Centerline

Orifice No.	X/L	X _o (F.S.)
1	0	238.00
2	.005	244.452
3	.020	263.806
4	.040	289.612
5	.060	315.418
6	.080	341.224
7	.100	367.030
8	.150	431.545
9	.200	496.060
10	.300	625.090
11	.400	754.120
12	.500	883.150
13	.600	1012.180
14	.800	1270.240
15	.950	1463.785
16	.975	1496.043
17	1.000	1528.300
18	1.025	1560.558
19	1.050	1592.815

Top Centerline

Orifice No.	X/L	X _o (F.S.)
20	.050	302.515
21	.100	367.030
22	.125	399.288
23	.150	431.545
24	.160	444.448
25	.170	457.351
26	.180	470.254
27	.200	496.060
28	.300	625.090
29	.600	1012.180

Bottom Surface
B.P = -50" (F.S.)

Orifice No.	X/L	X _o
33	.20	496.060
34	.30	625.090

Windshield Left Side

30	Center of forward window
31	Center of oblique window
32	Center of aft window

Cross Sections (Left Side)

Orifice No.	X/L	X _o (F.S.)	
35	.10	367.030	∅ = 10°
36			∅ = 20°
37			OCL Tangent
38			WHB Tangent
39	.2	496.060	OCL Tangent
40			∅ = 35°
41			∅ = 40°
42			∅ = 50° (Z=320)
43			∅=96.3 (Z=410)
44	.3	625.090	∅=33.1 (V _o =75)
45			∅ = 40
46			∅ = 45
47			∅ = 57 (Z=330)
48			∅=60.9 (Z=340)
49			∅=65 (Z=350)
50			∅=69 (Z=360)
51			∅=95.7 (Z=410)
52			∅ = 135
53	.60	1012.180	∅=79.3 (Z=380)
54			∅=95.5 (Z=410)
55			∅=103 (Z=425)
56			∅=112.6 (Z=440)
57			∅=135
58	.80	1270.24	∅=95.5 (Z=410)
59	.975	1496.043	∅=51.6 (Z=300)
60			∅=68.0 (Z=350)

TABLE IV. - Continued.

26-OTS Orbiter - Continued
0.010-Scale

OMS Pods (Left Side)

<u>Orifice</u> <u>No.</u>	<u>X/L</u>	<u>X_oFULL</u>	<u>Y_oFULL</u>	<u>Z_oFULL</u>	<u>θ°</u>
61	.780	1245	-95	474	127.9
62	.805	1276	-105.5	488	129.5
63	.829	1307	-117.0	498.7	130
64	.862	1350	-126.5	506	130
65	.963	1480	-134.5	513	130
66	.829	1307	-95.0	511	139.6
67	.963	1480	-95.0	530	144
68	.829	1307	-124.5	474	120.8
69	.963	1480	-142.5	474	117.5
70	1.000	1528.3	-142.5	474	117.5
71	1.0145	1547	Bottom of PCS		

Left Wing Bottom Surface

<u>b/2</u>	<u>Orifice</u> <u>No.</u>	<u>X/L</u>	<u>X/C</u>	<u>X_oFULL</u>
.25	72	.40	.153	754.120
$V_o=117.085$	73	.50	.299	883.150
$C=886.0$	74	.60	.444	1012.180
$X_{oLE}=612.5$	75	.80	.736	1270.240
.40	76	.592	.025	1002.063
$V_o=187.336$	77	.600	.045	1012.180
$C=502.5$	78	.660	.200	1090.000
$X_{oLE}=929.5$	79	.700	.300	1141.210
	80	.80	.559	1270.240
	81	.933	.900	1441.750
.50	82	.651	.025	1077.913
$V_o=234.170$	83	.700	.177	1141.210
$C=416.5$	84	.800	.487	1270.240
$X_{oLE}=1067.5$				
.60	85	.708	.100	1152.000
$V_o=281.004$	86	.800	.428	1270.240
$C=360.0$	87	.845	.600	1332.000
$X_{oLE}=1116.0$	88	.876	.700	1368.000
	89	.904	.800	1404.000
	90	.918	.850	1422.000
	91	.932	.900	1440.000

TABLE IV. - Continued.

26-OTS Orbiter - Continued
0.010-Scale

Left Wing Bottom Surface - Continued

<u>b/2</u>	<u>Orifice No.</u>	<u>X/L</u>	<u>X/C</u>	<u>X_oFULL</u>
.75				
Y _o =351.255	92	.740	.025	1193.425
C=277.0	93	.800	.302	1270.240
X _o LE=1186.5	94	.928	.900	1435.800
.85	95	.788	.100	1255.2
Y _o =398.089				
C=222.0				
X _o LE=1233.0				
.95	96	.826	.10	1303.850
Y _o =444.923	97	.924	.90	1430.650
C=158.5				
X _o LE=1288.0				
.99.8	98	.90	0-LE	1398.95

Leading Edge (Left Wing)
Rolled Down 30°

<u>b/2</u>	<u>Orifice No.</u>	<u>X/L</u>	<u>X_c</u>
.30106	99	.40	LE Rolled 30° Down
.34803	100	.50	LE Rolled 30° Down
.50	101	.643	LE Rolled 30° Down
.67	102 to 107	Group A - See Sketch	
.75	108		LE Rolled 30° Down
.85	109 to 114	Group B - See Sketch	

TABLE IV. - Continued.

26-OTS Orbiter - Continued
0.010-Scale

Right Wing Top Surface

<u>b/2</u>	<u>Orifice No.</u>	<u>X/L</u>	<u>X/c</u>	<u>X_oFULL</u>
.40	115	.602	.05	1014.625
Y _o =187.336	116	.660	.20	1090.000
C=502.5	117	.816	.60	1291.000
X _o LE=989.5				
.60	118	.736	.20	1188.000
Y _o =281.004	119	.848	.60	1332.000
C=360.0	120	.904	.80	1404.000
Y _o LE=1116.0	121	.932	.90	1440.000
	122	.946	.95	1458.000
.80	123	.782	.20	1246.960
Y _o =374.670	124	.884	.90	1378.070
C=187.3				
X _o LE=1209.5				

Vertical Tail (Left Side)

<u>Orifice No.</u>	<u>T/bv</u>	<u>Z_o</u>	<u>X_o</u>	<u>X/c</u>
125	.299	594.34	L.W.	0
126	.299	594.34	1438.2	.30
127	.299	594.34	1570.5	.90
128	.532	667.9	L.W.	0
129	.532	667.9	1500.8	.30
130	.532	667.9	1537.0	.50
131	.532	667.9	1585.5	.70
132	.532	667.9	1611.0	.90
133	.765	741.49	L.W.	0
134	.765	741.49	1563.8	.30
135	.765	741.49	1651.2	.90
136	.905	785.6	L.W.	0

TABLE IV. - Continued.

26-OTS

External Tank - 0.010-Scale

LT = 2174-309 = 1865 F.S. = 18.650 M.S.

Orifice No.	X/L	θ	X _{FS}	X _{MS}
501	.04	0°	74.60	0.746
502	.08	0°	149.20	1.492
503	.15	0°	279.75	2.7975
504	.40	0°	746.00	7.460
505	.60	0°	1119.00	11.190
506	.80	0°	1492.00	14.920
507	.40	45°	746.00	7.460
508	.60	45°	1119.00	11.190
509	.80	45°	1492.00	14.920
510	.90	45°	1678.50	16.785
511	.30	67.5°	559.50	5.595
512	.35	67.5°	652.75	6.5275
513	.40	67.5°	746.00	7.460
514	.50	67.5°	932.50	9.320
515	.60	67.5°	1119.00	11.190
516	.65	67.5°	1212.25	12.1225
517	.70	67.5°	1305.50	13.055
518	.75	67.5°	1398.75	13.9875
519	.80	67.5°	1492.00	14.920
520	.90	67.5°	1678.50	16.785
521	.20	90°	373.00	3.730
522	.25	90°	466.25	4.6625
523	.275	90°	512.875	5.12875
524	.30	90°	559.50	5.5950
525	.325	90°	606.125	6.06125
526	.35	90°	652.75	6.5275
527	.40	90°	746.00	7.460
528	.45	90°	839.25	8.3925
529	.50	90°	932.50	9.3250
530	.55	90°	1025.75	10.2575
531	.60	90°	1119.00	11.190
532	.65	90°	1212.25	12.1225
533	.70	90°	1305.50	13.0550
534	.75	90°	1398.75	13.9875
535	.80	90°	1492.00	14.9200
536	.85	90°	1585.25	15.8525
537	.90	90°	1678.50	16.7850
538	.275	112.5°	512.875	5.12875
539	.30	112.5°	559.50	5.5950
540	.325	112.5°	606.125	6.06125
541	.35	112.5°	652.75	6.5275
542	.40	112.5°	746.00	7.460
543	.45	112.5°	839.25	8.3925
544	.50	112.5°	932.50	9.3250

TABLE IV. - Continued.

26-OTS - Continued

Orifice No.	X/L	θ	XFS	XMS
545	.55	112.5°	1025.75	10.2575
546	.60	112.5°	1119.00	11.1900
547	.65	112.5°	1212.25	12.1225
548	.70	112.5°	1305.50	13.0550
549	.75	112.5°	1398.75	13.9875
550	.80	112.5°	1492.00	14.9200
551	.85	112.5°	1585.25	15.8525
552	.90	112.5°	1678.50	16.7850
553	.825	123°	1538.625	15.38625
554	.85	123°	1585.25	15.8525
555	.875	123°	1631.875	16.31875
556	.90	123°	1678.50	16.7850
557	.925	123°	1725.125	17.25125
558	.96	123°	1790.40	17.9040
559	.325	135°	606.125	6.06125
560	.35	135°	652.75	6.5275
561	.375	135°	699.375	6.99375
562	.40	135°	746.00	7.4600
563	.45	135°	839.25	8.3925
564	.50	135°	932.50	9.3250
565	.55	135°	1025.75	10.2575
566	.60	135°	1119.00	11.1900
567	.65	135°	1212.25	12.1225
568	.70	135°	1305.50	13.0550
569	.75	135°	1398.75	13.9875
570	.80	135°	1492.00	14.9200
571	.85	135°	1585.25	15.8525
572	.90	135°	1678.50	16.7850
573	.935	151°	1743.775	17.43775
574	.40	157.5°	746.00	7.4600
575	.425	157.5°	792.625	7.92625
576	.45	157.5°	839.25	8.3925
577	.475	157.5°	885.875	8.85875
578	.50	157.5°	932.50	9.3250
579	.55	157.5°	1025.75	10.2575
580	.60	157.5°	1119.00	11.1900
581	.65	157.5°	1212.25	12.1225
582	.70	157.5°	1305.50	13.0550
583	.75	157.5°	1398.75	13.9875
584	.80	157.5°	1492.00	14.9200
585	.85	157.5°	1585.25	15.8525
586	.90	157.5°	1678.50	16.7850
587	.425	161°	792.625	7.92625
588	.50	166°	932.50	9.3250
589	.70	166°	1305.50	13.0550
590	.90	166°	1678.50	16.7850

TABLE IV. - Continued.

26-OTS - Continued

Orifice No.	X/L	θ	X _{FS}	X _{MS}
591	.40	167°	746.00	7.4600
592	0.00	180°	0.00	0.00
593	.005	180°	9.325	0.09325
594	.01	180°	18.65	0.1865
595	.04	180°	74.60	0.7460
596	.08	180°	149.20	1.4920
597	.15	180°	279.75	2.7975
598	.20	180°	373.00	3.730
599	.25	180°	466.25	4.6625
600	.30	180°	559.50	5.5950
601	.35	180°	652.75	6.5275
602	.375	180°	699.375	6.99375
603	.40	180°	746.00	7.460
604	.425	180°	792.625	7.92625
605	.45	180°	839.25	8.3925
606	.475	180°	885.875	8.85875
607	.50	180°	932.50	9.3250
608	.525	180°	979.125	9.79125
609	.55	180°	1025.75	10.2575
610	.575	180°	1072.375	10.72375
611	.60	180°	1119.00	11.1900
612	.65	180°	1212.25	12.1225
613	.70	180°	1305.50	13.0550
614	.75	180°	1398.75	13.9875
615	.80	180°	1492.00	14.920
616	.85	180°	1585.25	15.8525
617	.90	180°	1678.50	16.7850
618	.937	180°	1747.505	17.47505
619	.975	180°	1818.375	18.18375
620	.08	197°	149.20	1.4920
621	.15	197°	279.75	2.7975
622	.30	197°	559.50	5.5950
623	.50	197°	932.50	9.3250
624	.70	197°	1305.50	13.0550
625	.90	197°	1678.50	16.7850
626	.15	210°	279.75	2.7975
627	.40	210°	746.00	7.4600
628	.60	210°	1119.00	11.1900
629	.80	210°	1492.00	14.9200
630	.937	210°	1747.505	17.47505
631	.40	220°	746.00	7.4600
632	.50	220°	932.50	9.3250
633	.70	220°	1305.50	13.0550
634	.335	225°	624.775	6.24775
635	.40	232°	746.00	7.4600
636	.60	232°	1119.00	11.1900
637	.80	232°	1492.00	14.9200

TABLE IV. - Concluded.

26-OTS Solid Rocket Motor
0.010-Scale

Orifice No.	X/L	ψ°	$X_s(\text{FULL})$	Orifice No.	X/L	ψ°	$X_s(\text{FULL})$
701	.00	90	200.000	735	.900	225	1708.400
702	.025	90	241.900	736	.930	225	1758.680
703	.050	90	283.800	737	.960	225	1808.960
704	.100	90	367.600	738	.990	225	1859.240
705	.400	90	870.400	739	.930	240	1758.680
706	.700	90	1373.200	740	.960	240	1808.960
707	.780	90	1498.0	741	.990	240	1859.240
708	.800	90	1540.800	742	.300	247.5	702.800
709	.930	90	1758.680	743	.400	247.5	870.400
710	.990	90	1859.240	744	.500	247.5	1038.000
711	.050	180	283.800	745	.600	247.5	1205.600
712	.100	180	367.600	746	.700	247.5	1373.200
713	.200	180	535.200	747	.115	260	392.740
714	.400	180	870.400	748		270	(45° RL from nose radius)
715	.600	180	1205.600	749	.025	270	241.900
716	.700	180	1373.200	750	.050	270	283.800
717	.780	180	1498.0	751	.075	270	325.700
718	.800	180	1540.800	752	.100	270	367.600
719	.900	180	1708.400	753	.110	270	384.360
720	.930	180	1758.680	754	.130	270	417.880
721	.960	180	1808.960	755	.150	270	451.400
722	.990	180	1859.240	756	.200	270	535.200
723	.910	210	1725.160	757	.300	270	702.800
724	.920	210	1741.920	758	.400	270	870.400
725	.930	210	1758.680	759	.500	270	1038.000
726	.950	210	1764.440	760	.600	270	1205.600
727	.925	215	1736.42	761	.700	270	1373.200
728	.940	215	1775.440	762	.780	270	1498.0
729	.960	215	1808.960	763	.800	270	1540.800
730	.150	225	451.400	764	.900	270	1708.400
731	.400	225	870.400	765	.930	270	1758.680
732	.600	225	1205.600	766	.990	270	1859.240
733	.780	225	1498.0	767	.300	315	702.800
734	.800	225	1540.800	768	.700	315	1373.200

Skirt
Diagram

TABLE V.

ORIFICE VS VALVE-PORT

Orifice	Valve	Port	Orifice	Valve	Port	Orifice	Valve	Port
1	12	4	41	10	17	81	2	10
2	12	5	42	10	18	82	10	28
3	12	6	43	4	4	83	6	33
4	12	7	44	10	19	84	6	8
5	12	8	45	10	20	85	8	9
6	10	4	46	10	21	86	6	9
7	10	5	47	4	5	87	6	10
8	10	6	48	4	6	88	2	11
9	10	7	49	4	7	89	2	12
10	10	8	50	4	8	90	2	13
11	6	28	51	4	9	91	2	14
12	6	4	52	4	10	92	10	29
13	6	5	53	4	11	93	6	34
14	2	4	54	4	12	94	2	15
15	2	5	55	4	13	95	10	30
16	2	6	56	4	14	96	10	31
17	2	7	57	4	15	97	4	24
18	2	8	58	4	16	98	10	32
19	2	9	59	4	17	99	10	33
20	7	4	60	4	18	100	10	34
21	7	5	61	7	7	101	10	35
22	7	6	62	7	8	102	12	9
23	8	10	63	7	9	103	10	22
24	8	11	64	7	10	104	10	23
25	8	12	65	4	19	105	12	10
26	8	13	66	7	11	106	12	11
27	8	14	67	4	20	107	10	24
28	1	4	68	7	12	108	12	12
29	1	5	69	4	21	109	12	13
30	8	15	70	4	22	110	6	35
31	8	16	71	4	23	111	6	36
32	8	17	72	10	25	112	12	14
33	10	9	73	6	29	113	10	36
34	10	10	74	6	30	114	6	37
35	10	11	75	6	6	115	8	18
36	10	12	76	10	26	116	1	6
37	10	13	77	10	27	117	1	7
38	10	14	78	6	31	118	1	8
39	10	15	79	6	32	119	1	9
40	10	16	80	6	7	120	1	10

TABLE V. - Continued.

ORIFICE VS VALVE-PORT

Orifice	Valve	Port	Orifice	Valve	Port	Orifice	Valve	Port
121	P L U G G E D		521	1	23	561	9	27
122	1	12	522	9	8	562	9	28
123	1	13	523	9	9	563	9	29
124	1	14	524	9	10	564	9	30
125	12	15	525	9	11	565	9	31
126	2	16	526	9	12	566	3	30
127	2	17	527	9	13	567	3	31
128	12	16	528	9	14	568	3	32
129	2	18	529	9	15	569	3	33
130	2	19	530	9	16	570	3	34
131	2	20	531	3	10	571	3	35
132	2	21	532	P L U G G E D		572	3	36
133	12	17	533	3	12	573	5	4
134	2	22	534	3	13	574	11	4
135	2	23	535	3	14	575	11	5
136	12	18	536	3	15	576	11	6
			537	3	16	577	11	7
			538	9	17	578	11	8
			539	9	18	579	11	9
			540	9	19	580	5	5
501	7	13	541	9	20	581	5	6
502	7	14	542	9	21	582	5	7
503	1	15	543	9	22	583	5	8
504	1	16	544	9	23	584	5	9
505	1	17	545	9	24	585	5	10
506	1	18	546	3	17	586	5	11
507	1	19	547	3	18	587	11	10
508	1	20	548	3	19	588	11	11
509	1	21	549	3	20	589	5	12
510	1	22	550	3	21	590	P L U G G E D	
511	9	4	551	3	22	591	11	12
512	9	5	552	3	23	592	12	19
513	9	6	553	P L U G G E D		593	12	20
514	9	7	554	3	25	594	12	21
515	3	4	555	3	26	595	7	15
516	3	5	556	3	27	596	7	16
517	3	6	557	3	28	597	3	37
518	3	7	558	P L U G G E D		598	3	38
519	3	8	559	9	25	599	11	13
520	3	9	560	9	26	600	11	14

TABLE V - Concluded.

ORIFICE VS VALVE-PORT

Orifice	Valve	Port	Orifice	Valve	Port	Orifice	Valve	Port
601	11	15	701	12	22	741	7	23
602	11	16	702	5	37	742	6	16
603	11	17	703	5	32	743	6	17
604	11	18	704	5	33	744	6	18
605	11	19	705	1	24	745	6	19
606	11	20	706	1	25	746	6	20
607	11	21	707	12	23	747	12	30
608	11	22	708	12	24	748	12	31
609	11	23	709	7	18	749	11	34
610	11	24	710	7	19	750	11	35
611	5	14	711	11	32	751	11	36
612	5	15	712	11	33	752	12	32
613	5	16	713	9	32	753	12	33
614	5	17	714	6	11	754	12	34
615	5	18	715	P L U G G E D			12	35
616	5	19	716	6	13	756	9	33
617	5	20	717	12	25	757	6	21
618	5	21	718	12	26	758	6	22
619	5	22	719	7	20	759	6	23
620	7	17	720	8	4	760	6	24
621	3	39	721	8	5	761	6	25
622	11	25	722	7	21	762	12	36
623	11	26	723	8	19	763	12	37
624	5	23	724	8	20	764	7	24
625	5	24	725	8	21	765	7	25
626	3	40	726	8	22	766	O P E N	
627	11	27	727	8	23	767	6	26
628	5	25	728	8	24	768	6	27
629	5	26	729	8	25			
630	5	27	730	12	27			
631	11	28	731	6	14			
632	11	29	732	6	15			
633	5	28	733	12	28			
634	11	30	734	12	29			
635	11	31	735	7	22			
636	5	29	736	8	26			
637	5	30	737	8	27			
			738	O P E N				
			739	8	7			
			740	8	8			

TABLE VI
VALVE-PORT VS ORIFICE NUMBER

PORT	VALVE					
	1	2	3	4	5	6
4	28	14	515	43	573	12
5	29	15	516	47	580	13
6	116	16	517	48	581	75
7	117	17	518	49	582	80
8	118	18	519	50	583	84
9	119	19	520	51	584	86
10	120	81	531	52	585	87
11		88		53	586	714
12	122	89	533	54	589	
13	123	90	534	55		716
14	124	91	535	56	611	731
15	503	94	536	57	612	732
16	504	126	537	58	613	742
17	505	127	546	59	614	743
18	506	129	547	60	615	744
19	507	130	548	65	616	745
20	508	131	549	67	617	746
21	509	132	550	69	618	757
22	510	134	551	70	619	758
23	521	135	552	71	624	759
24	705			97	625	760
25	706		554		628	761
26			555		629	767
27			556		630	768
28			557		633	11
29					636	73
30			566		637	74
31			567			78
32			568		703	79
33			569		704	83
34			570			93
35			571			110
36			572			111
37			597		702	114
38			598			
39			621			
40			626			

TABLE VI. - Concluded.
VALVE-PORT VS ORIFICE NUMBER

PORT	VALVE					
	7	8	9	10	11	12
4	20	720	511	6	574	1
5	21	721	512	7	575	2
6	22		513	8	576	3
7	61	739	514	9	577	4
8	62	740	522	10	578	5
9	63	85	523	33	579	102
10	64	23	524	34	587	105
11	66	24	525	35	588	106
12	68	25	526	36	591	108
13	501	26	527	37	599	109
14	502	27	528	38	600	112
15	595	30	529	39	601	125
16	596	31	530	40	602	128
17	620	32	538	41	603	133
18	709	115	539	42	604	136
19	710	723	540	44	605	592
20	719	724	541	45	606	593
21	722	725	542	46	607	594
22	735	726	543	103	608	701
23	741	727	544	104	609	707
24	764	728	545	107	610	708
25	765	729	559	72	622	717
26		736	560	76	623	718
27		737	561	77	627	730
28			562	82	631	733
29			563	92	632	734
30			564	95	634	747
31			565	96	635	748
32			713	98	711	752
33			756	99	712	753
34				100	749	754
35				101	750	755
36				113	751	762
37						763
38						
39						
40						

TABLE VII. - S-V CONFIGURATION VS TRANSDUCER

TRANSDUCER LOCATION

TRANSDUCER	RATED LOAD-PSIA
A	5
B	5
C	5
D	5
E	5
F	10
G	10
H	10
I	15
J	15
K	15
L	15

CONFIGURATION VS TRANSDUCER

CONFIG.	VALVE											
	1	2	3	4	5	6	7	8	9	10	11	12
I.V.	A	B	C	D	E	F	G	H	I	J	K	L
ORB.	A	B	*F	D	*E	C	G	H	*I	J	*K	L
TANK	A	*I	C	*K	E	*F	G	*H	B	*J	D	L
SRB	A	*I	*F	*K	E	C	G	H	B	*J	D	L

*Not used for this configuration

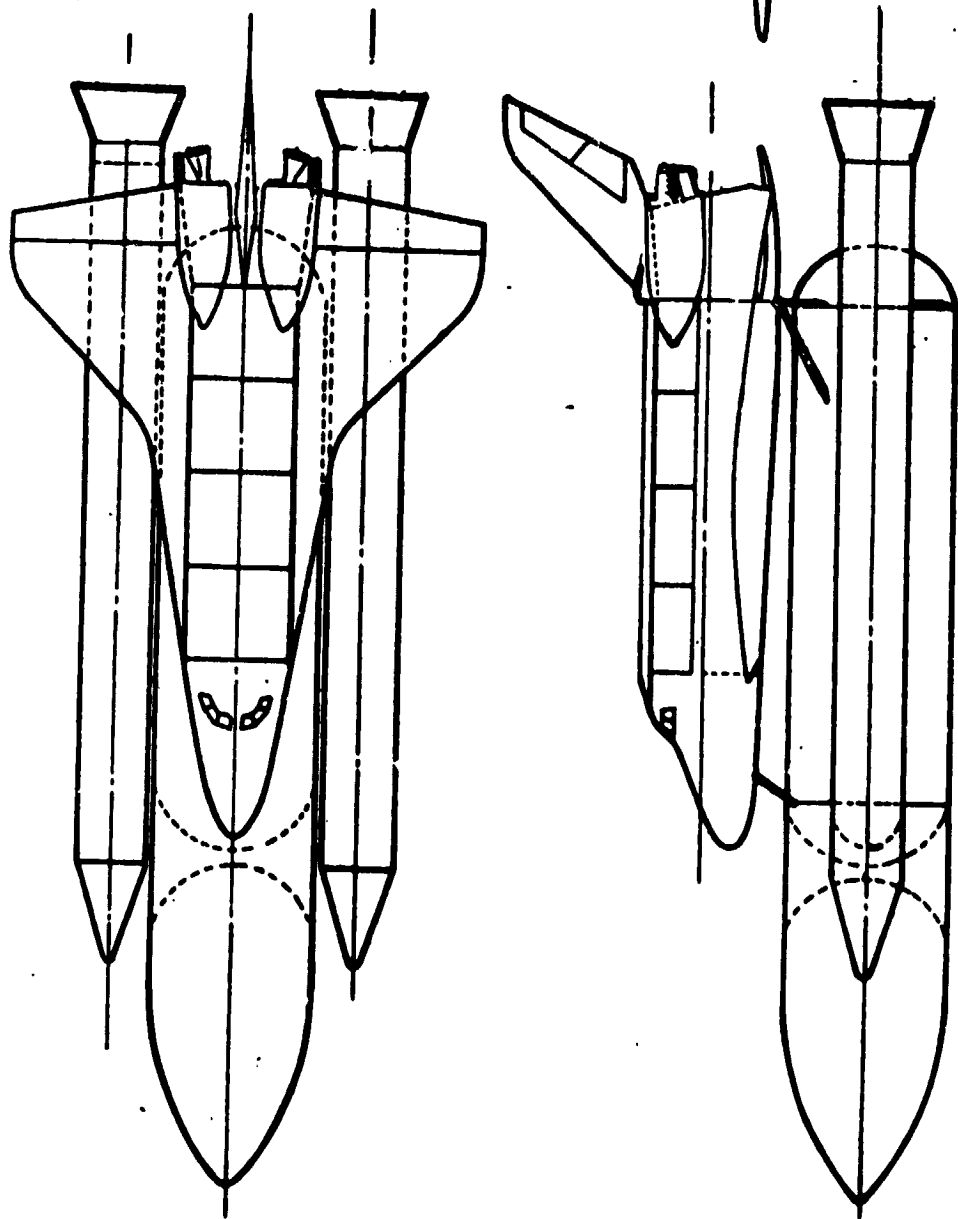
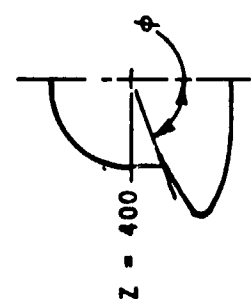
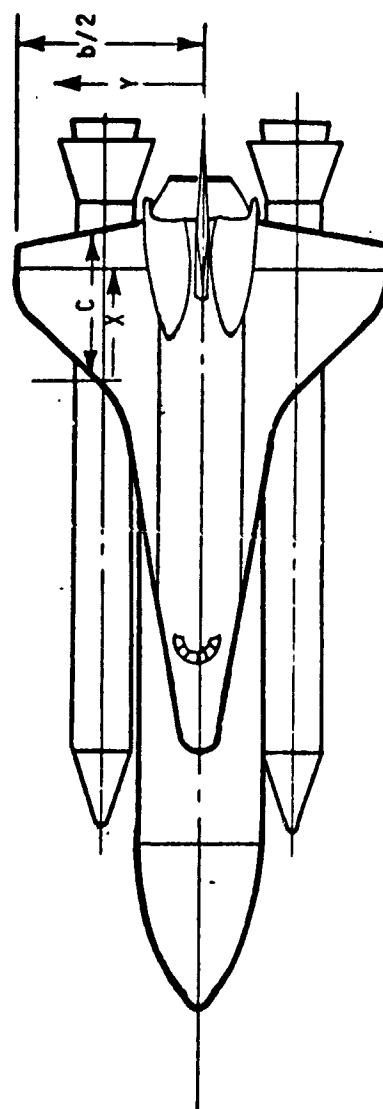
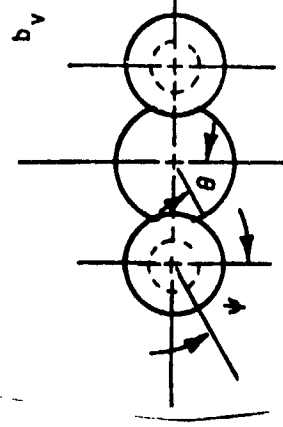
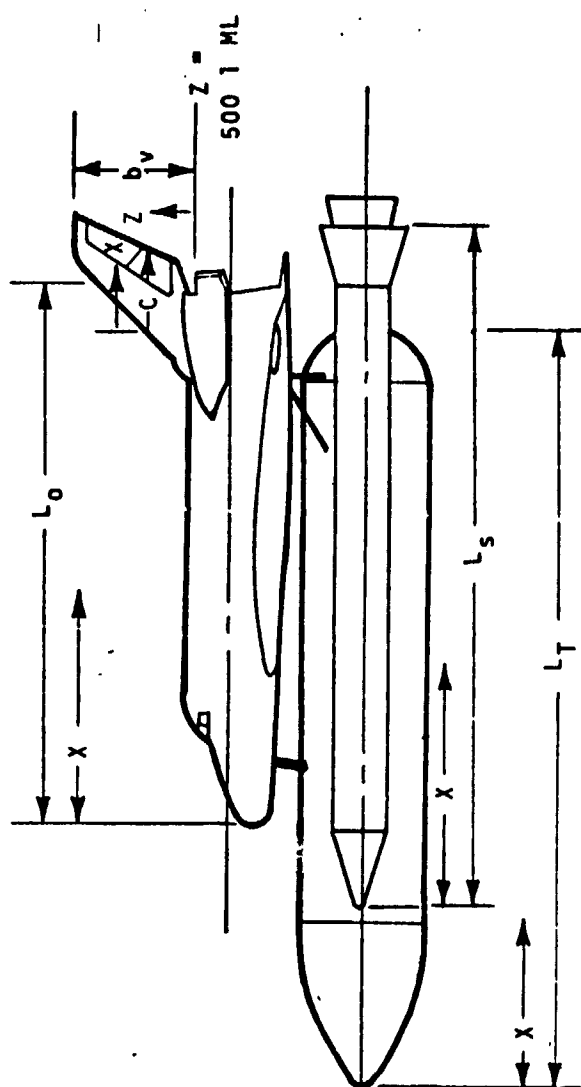


Figure 1. - Integrated Vehicle General Arrangement.



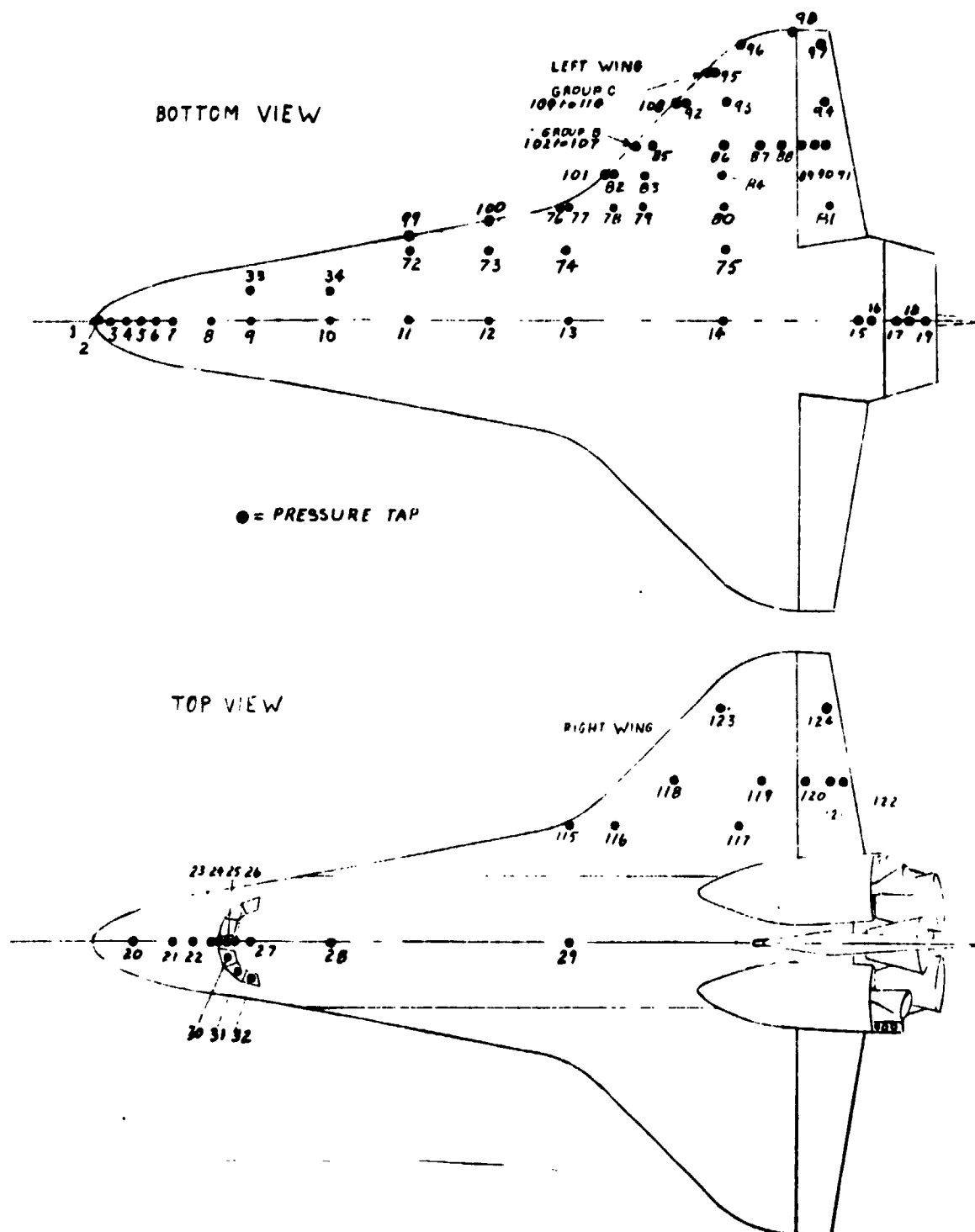
VIEW LOOKING FORWARD ψ ,
 θ AND ϕ MEASURED FROM
 BOTTOM & CLOCKWISE

- $L_0 = 1290.3$
- $L_T = 1865.0$
- $L_s = 1676.0$
- $b/2 = 468.34$
- $b_v = 315.72$

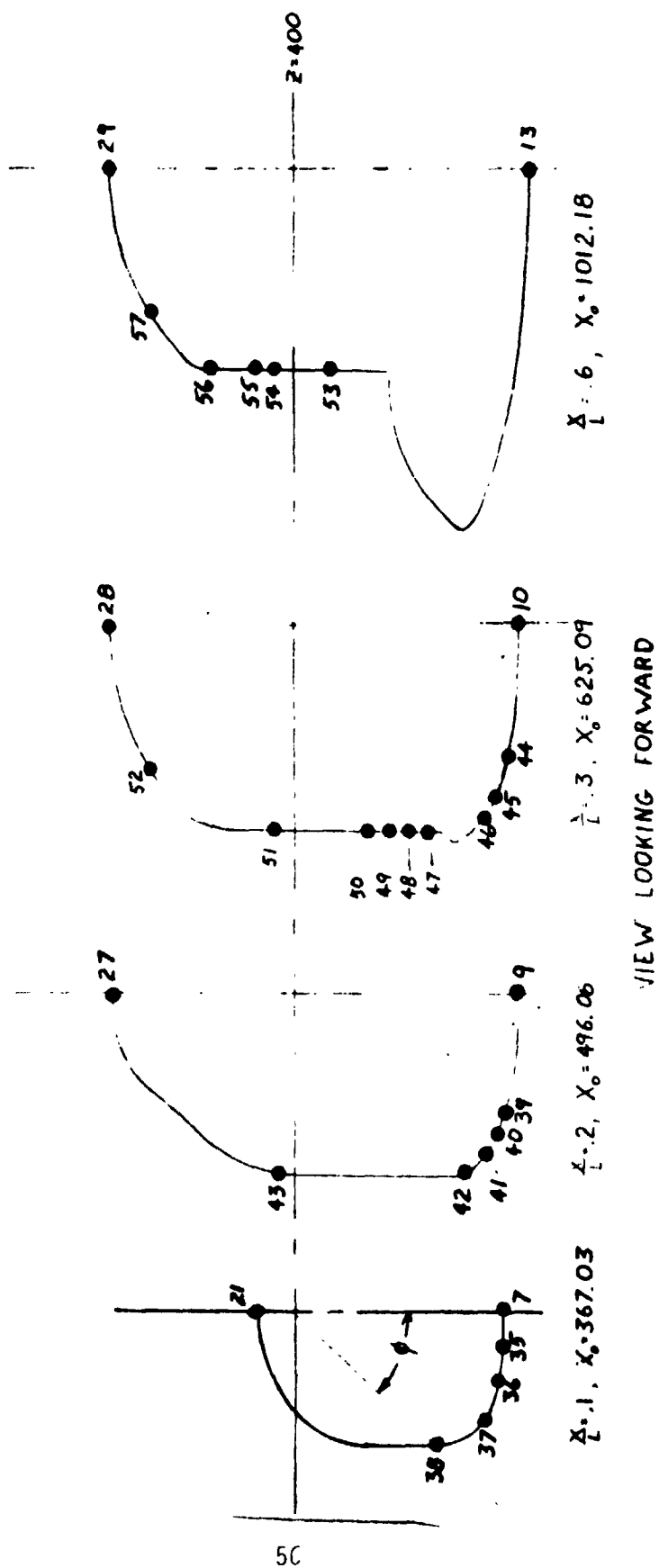


a. Instrumentation Location

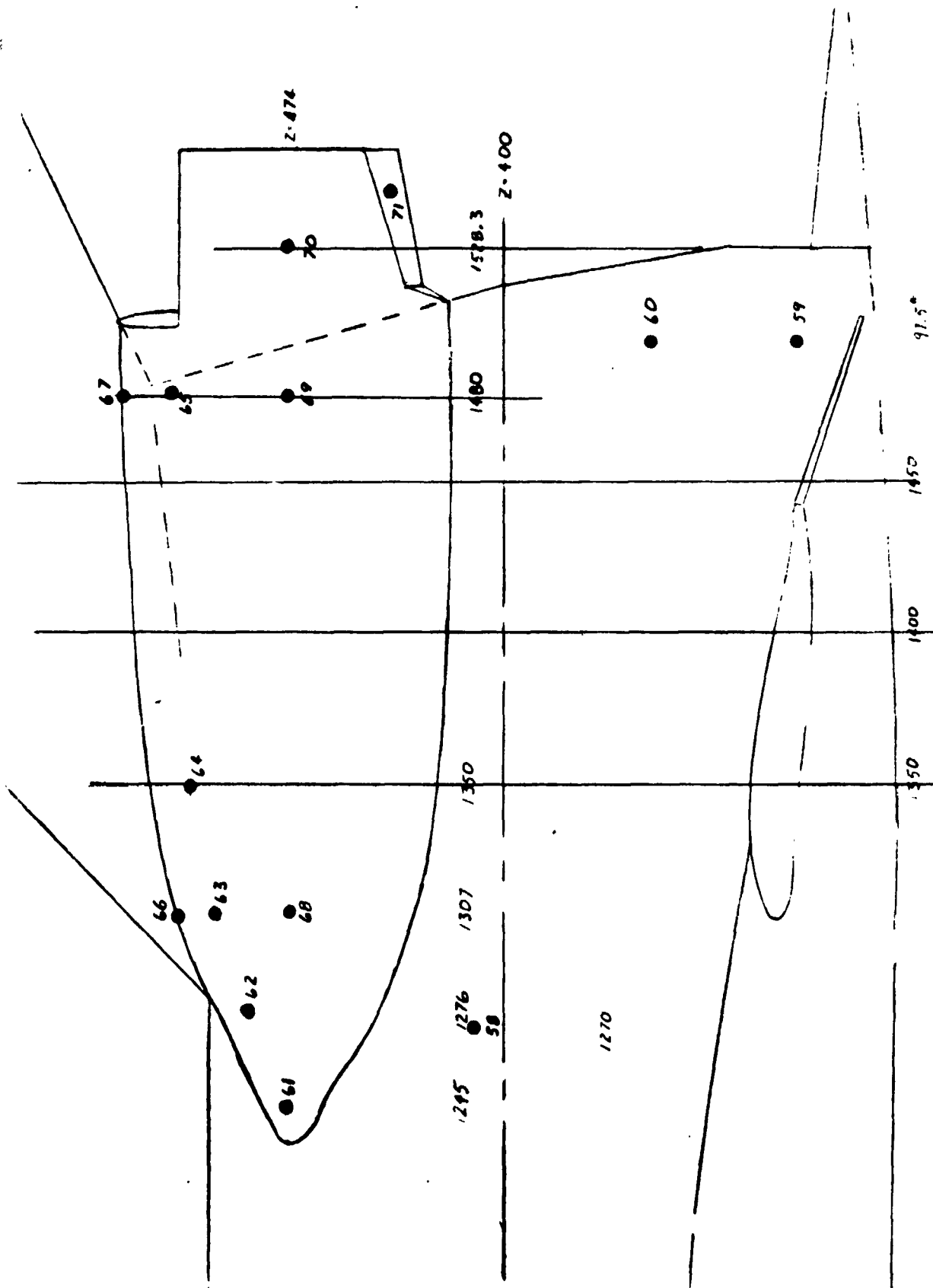
Figure 2. - Model sketches.



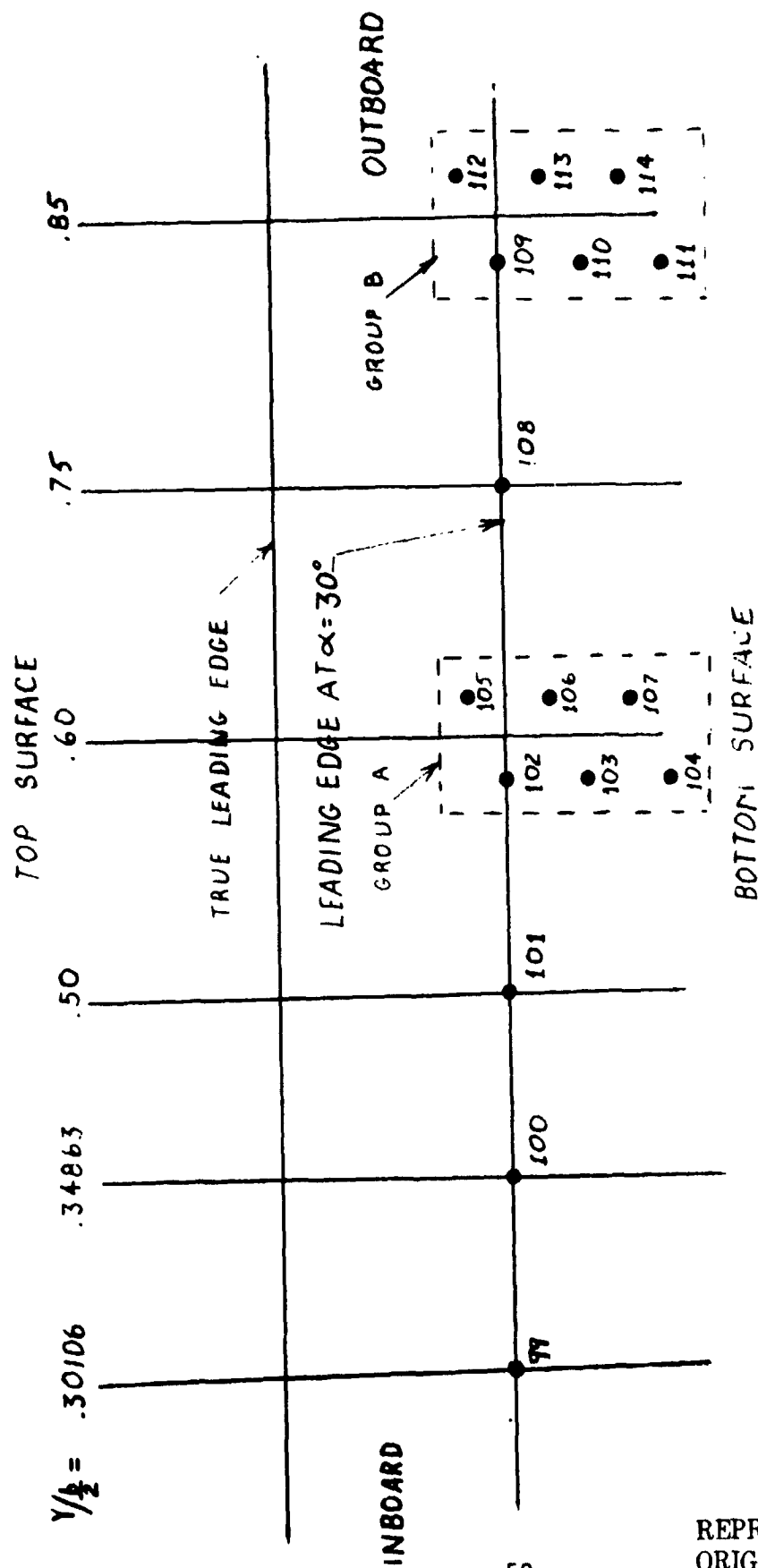
b. 26-OTS Orbiter
Figure 2. - Continued.



c. 26-OTS Orbiter Fuselage Cross-Section
Figure 2. - Continued.



d. 26-OTS Orbiter OMS Pods
Figure 2. - Continued.

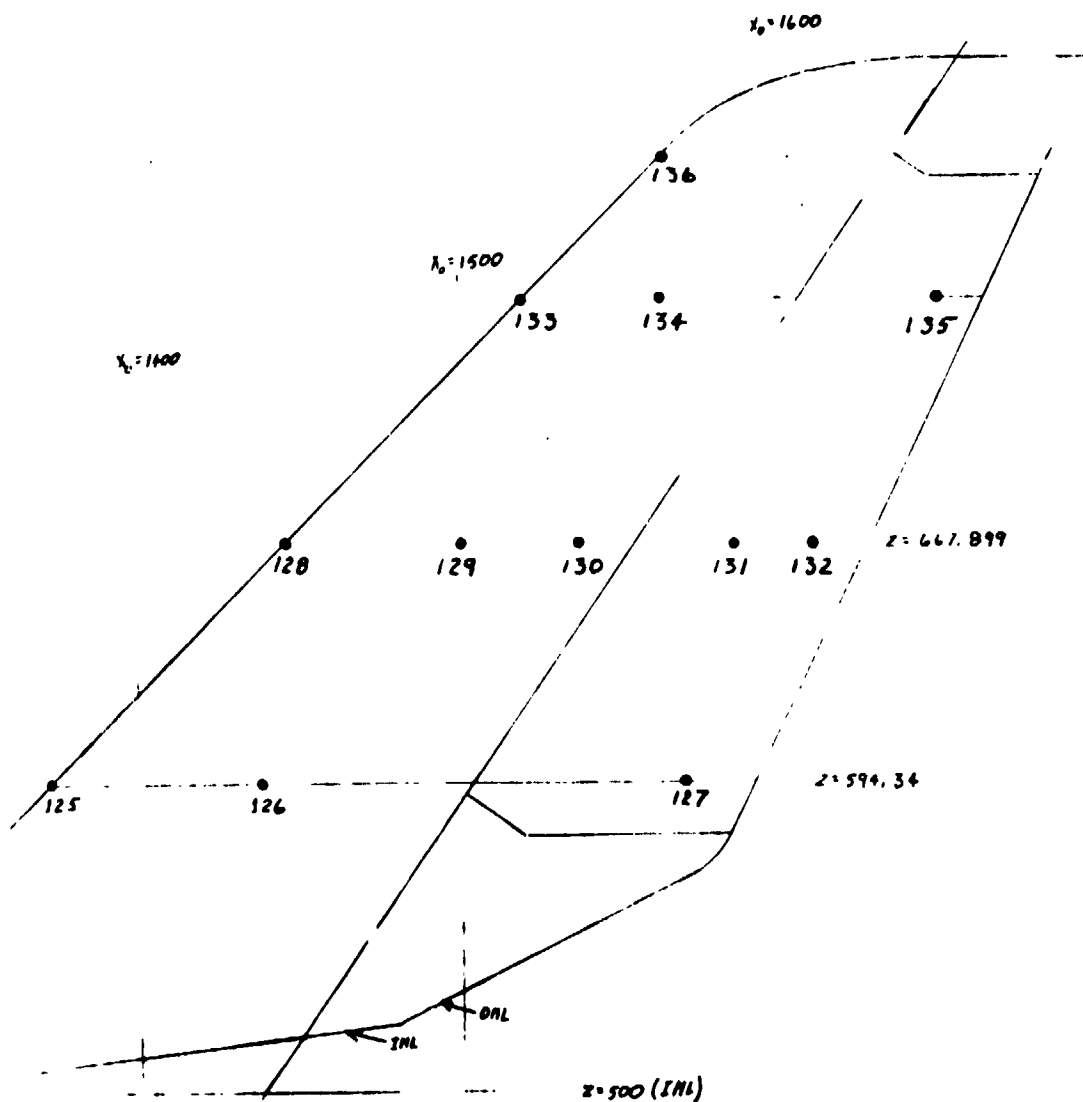


* NOT TO SCALE

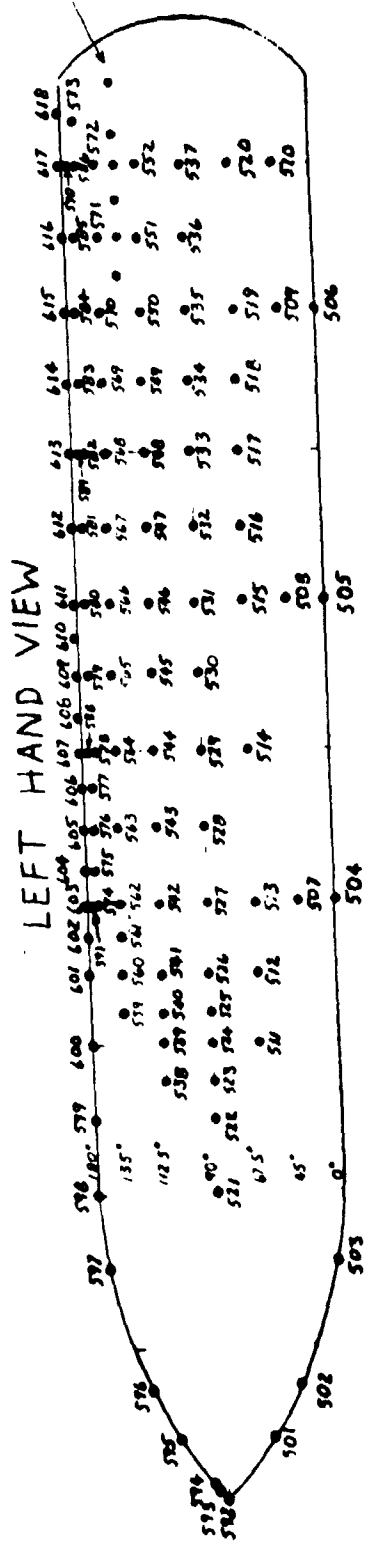
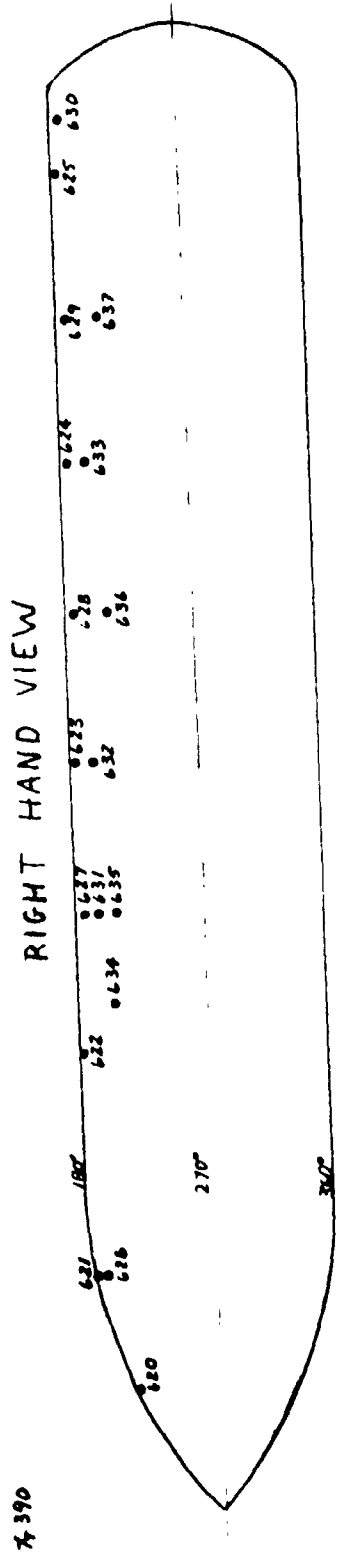
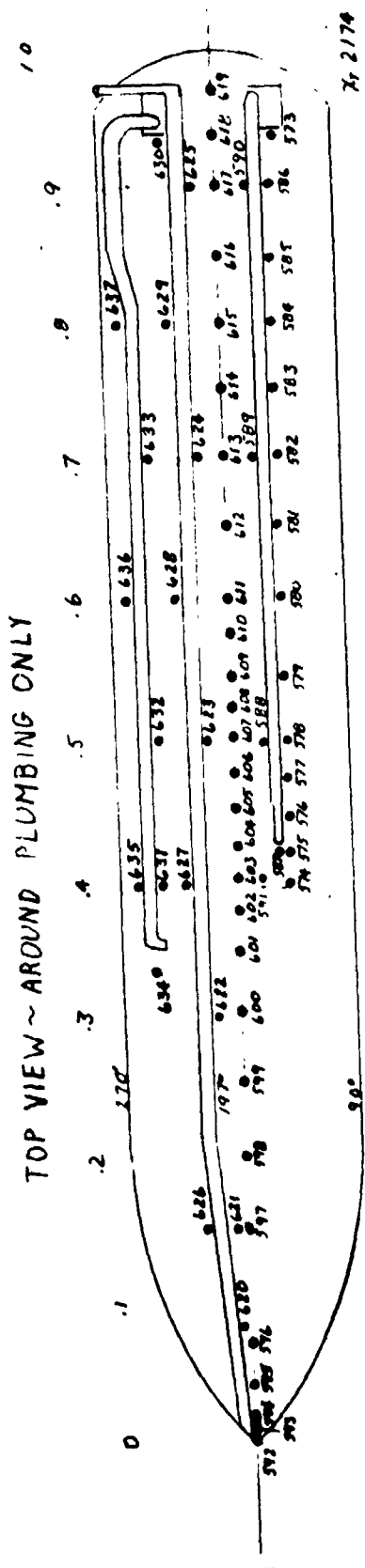
LOOKING AFT

e. Left Wing Leading Edge
Figure 2. - Continued.

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ORIGINAL PAGE IS POOR



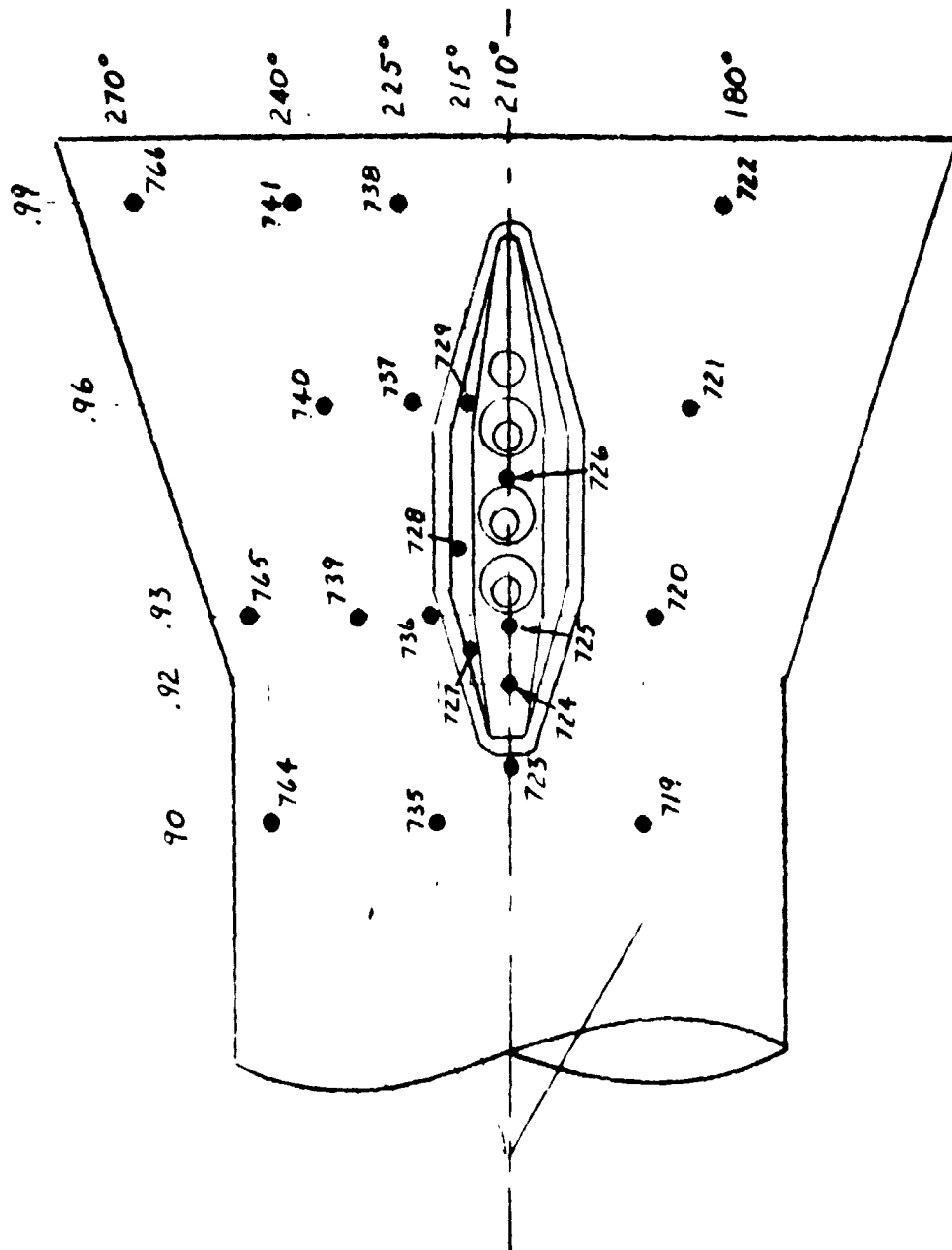
f. 26-OTS Vertical Tail
Figure 2. - Continued.



g. 26-QTS ET Pressure Tap Locations
Figure 2. - Continued.



h. 26-OTS SRB Pressure Tap Locations



i. 26-OTS SRB Skirt Detail
Figure 2. - Concluded.



a. Integrated Vehicle, $O_1 + T_{15} + S_8$ N16
Figure 3. - Model photographs.



b. Integrated Vehicle, $O_1 + T_{22} + S_8 N_{16}$

Figure 3. - Continued.



c. Orbiter, 0₁

Figure 3. - Continued.



d. External Tank, T_{15}

Figure 3. - Continued.



e. Solid Rocket Booster, S8

Figure 3. - Concluded.

DATA FIGURES

Volume 1--pages 1-513

Volume 2--pages 514-973

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(R03BAD) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	95.000	3.700		BETA
	.000				-5.000

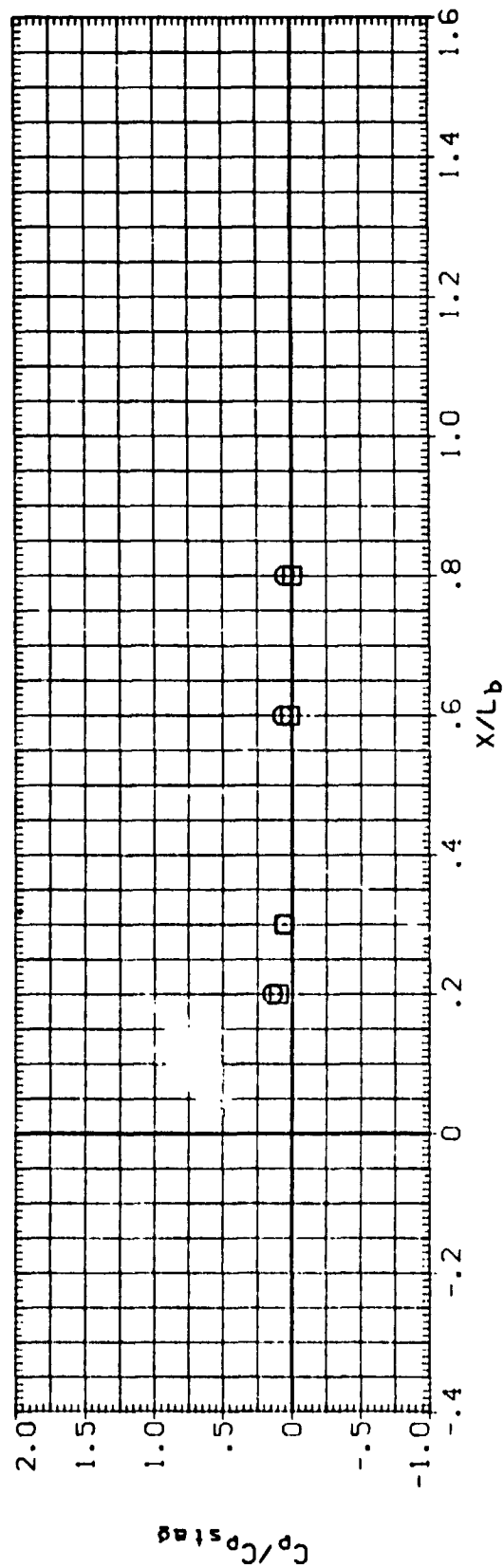
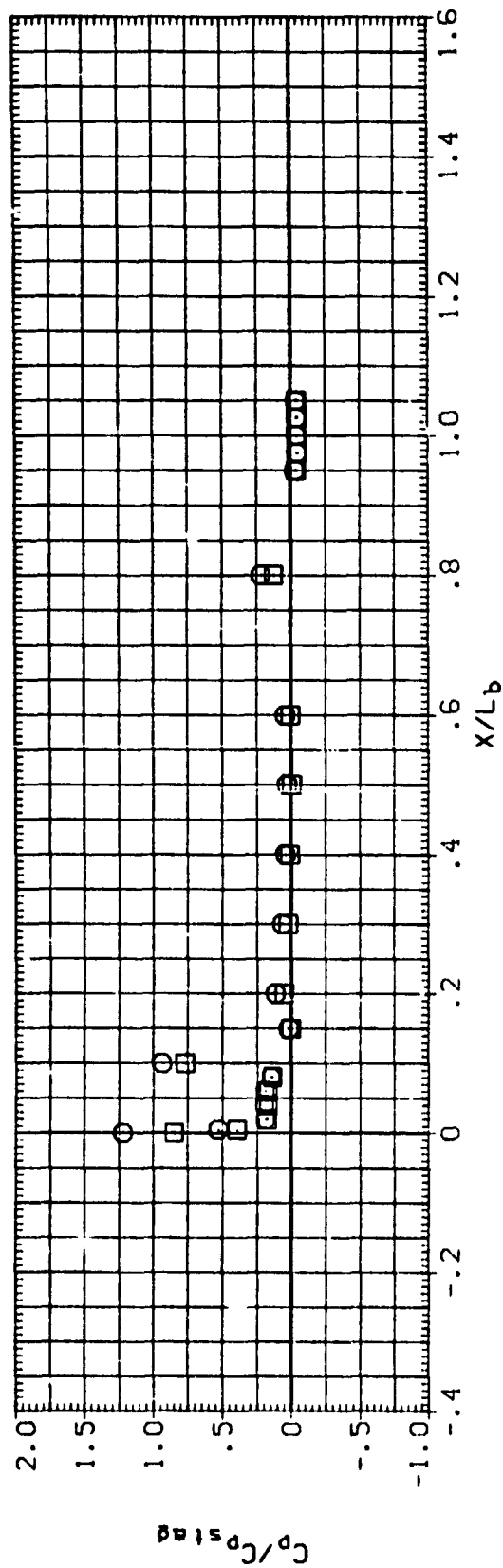


FIG. 4 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA=-5. RN/L= 3.0

(RQ38AD) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

PARAMETRIC VALUES
RN/L 3.000 BETA -5.000

ALPHA PHJ MACH
-5.000 180.000 3.700
.000 122.700

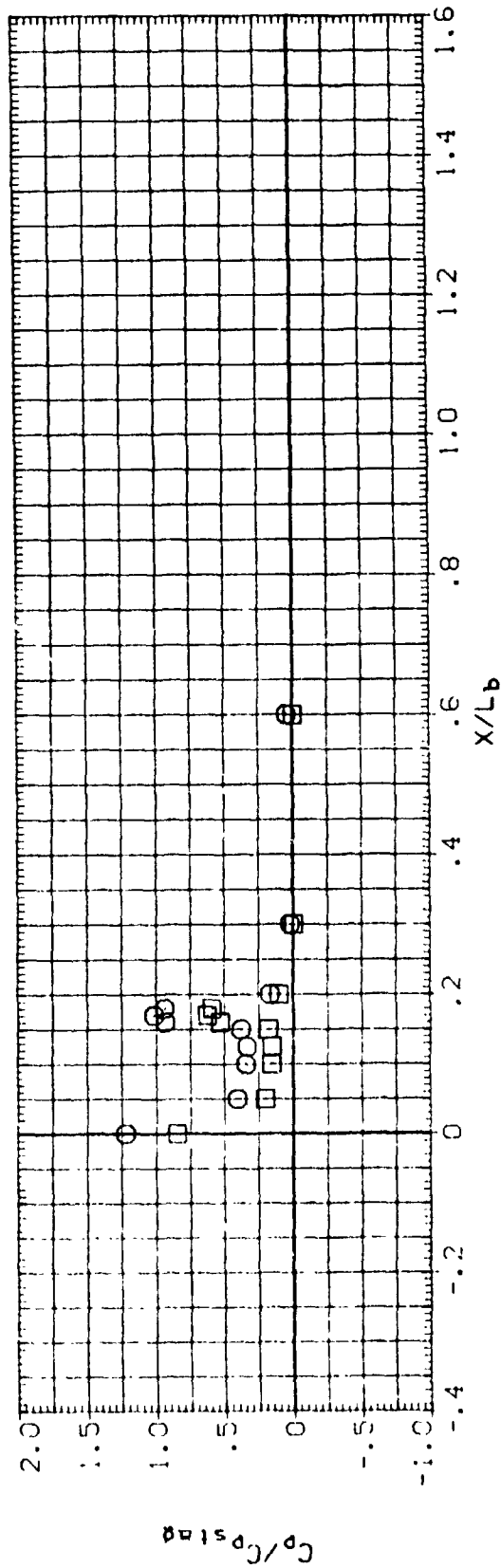
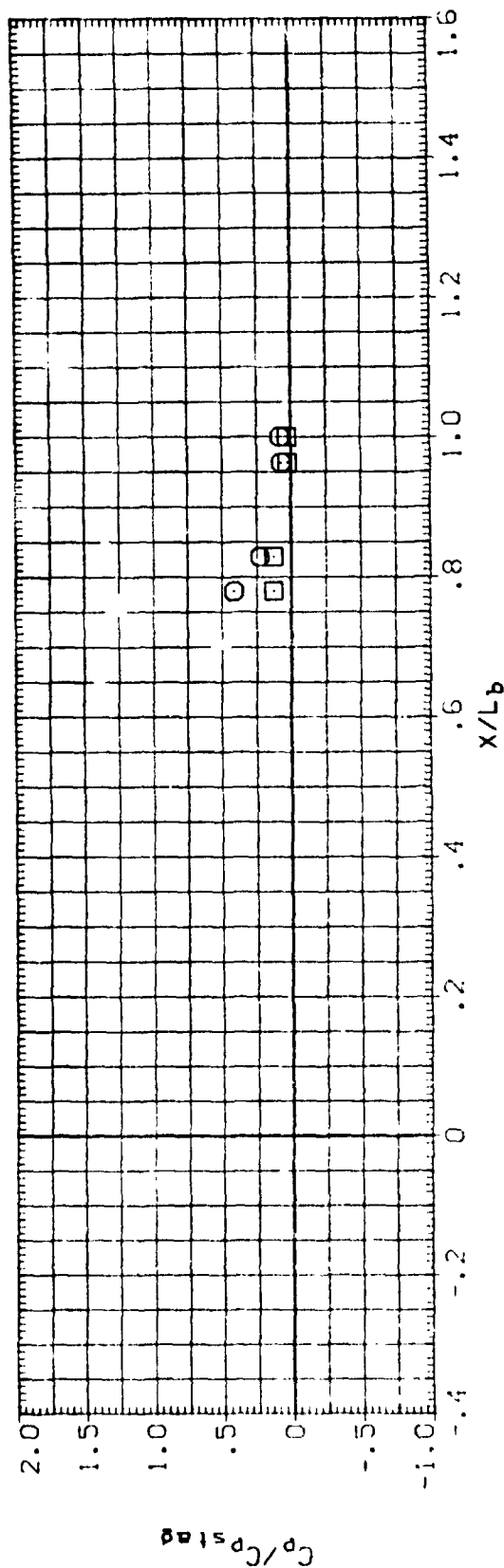


FIG. 4 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA=-5. RN/L= 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(R03BAD) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	95.000	4.600	3.000	BETA
	.000	.000			-5.000

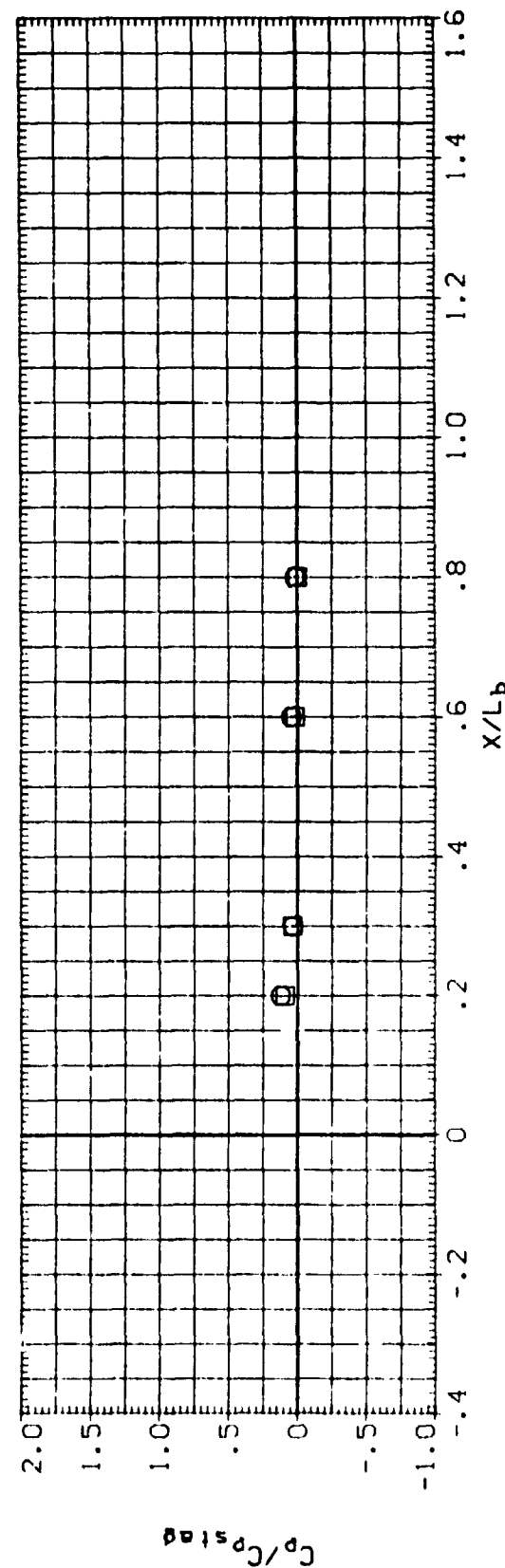
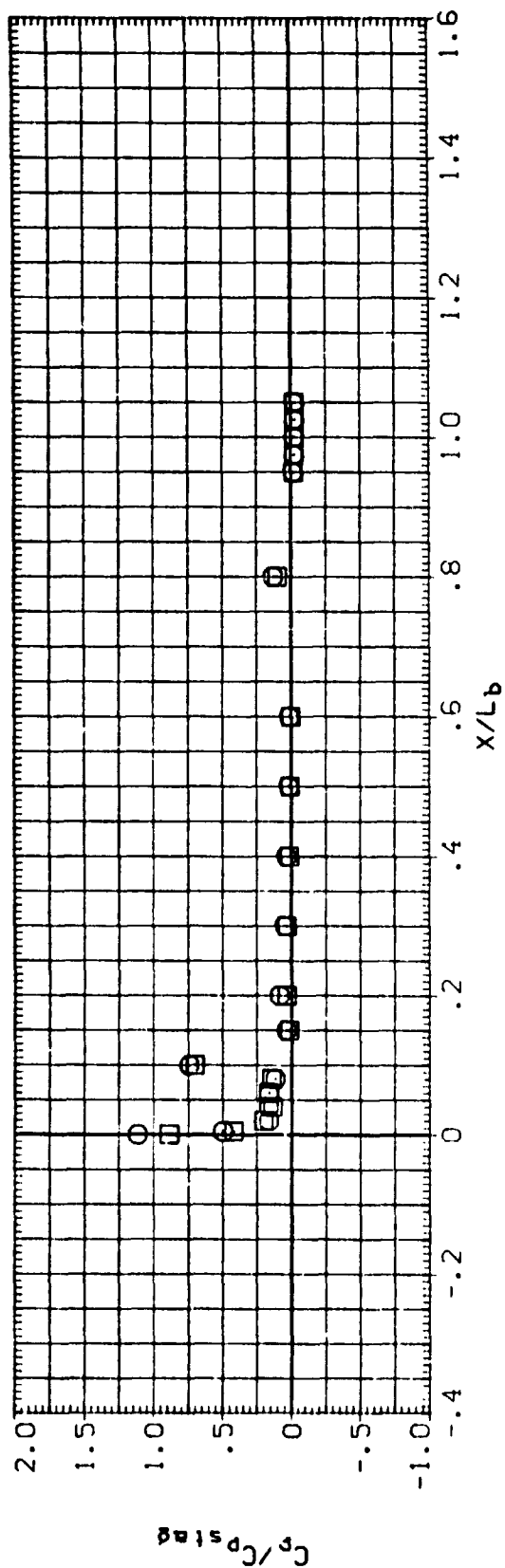


FIG. 4 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA=-5, RN/L= 3.0

(R03BAD) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA PHI MACH
 -5.000 180.000 4.600
 .000 122.700

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

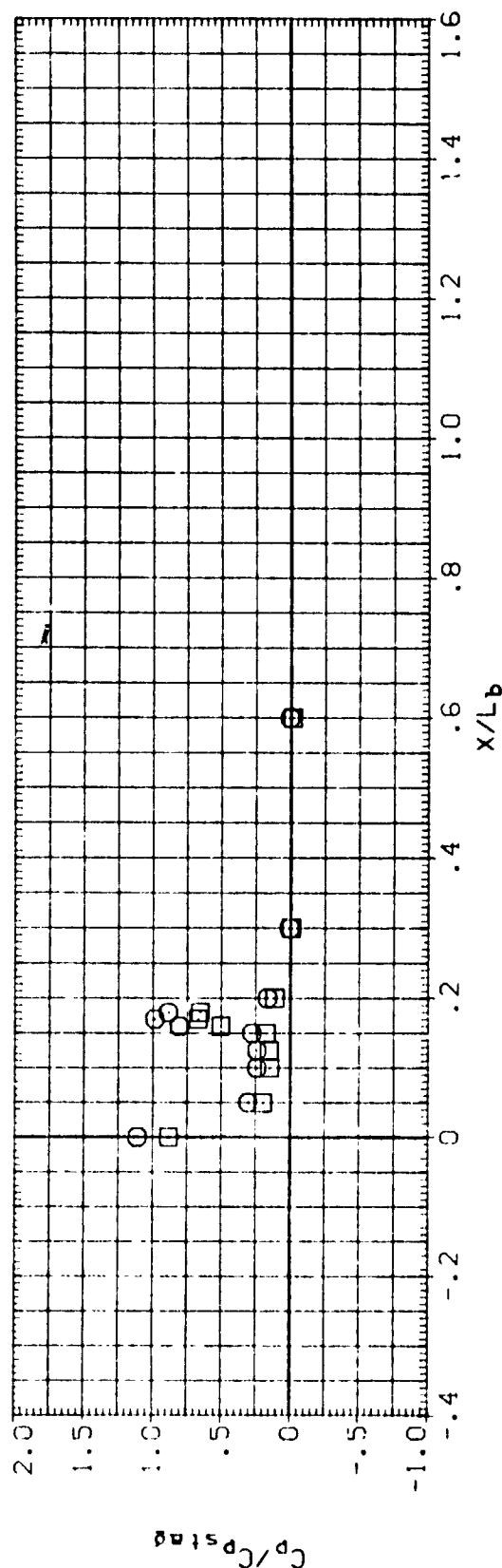
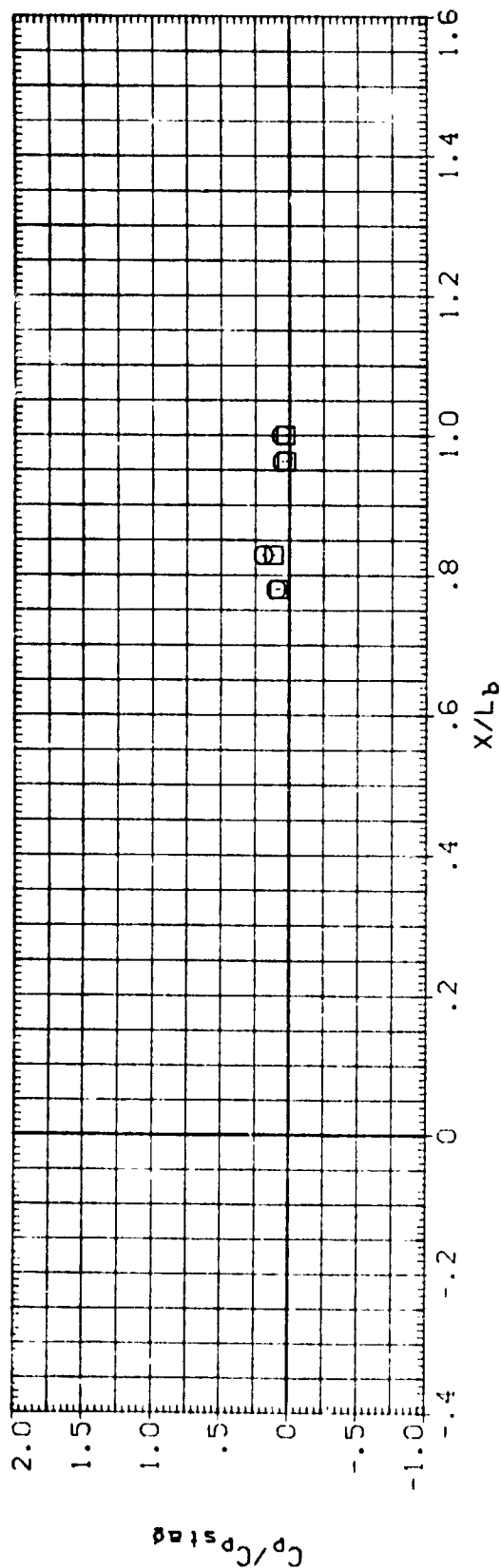


FIG. 4 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA=-5. RN/L= 3.0

(RQ3BAD) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.200	3.700		3.000 BETA
□	.000	.100			-5.000

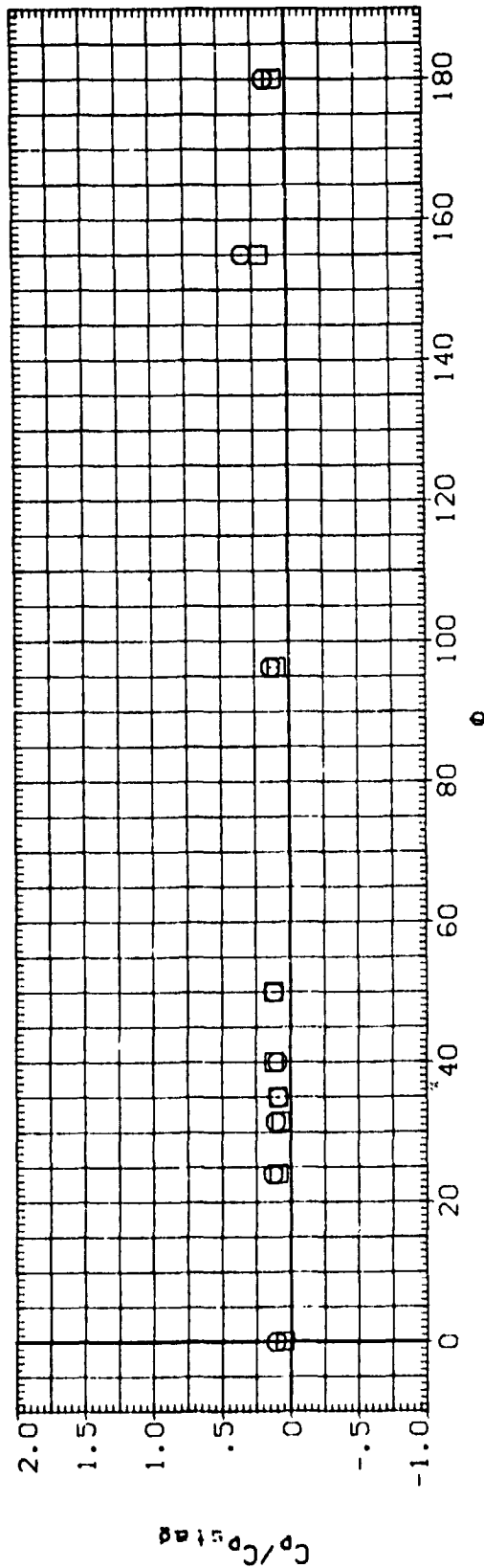
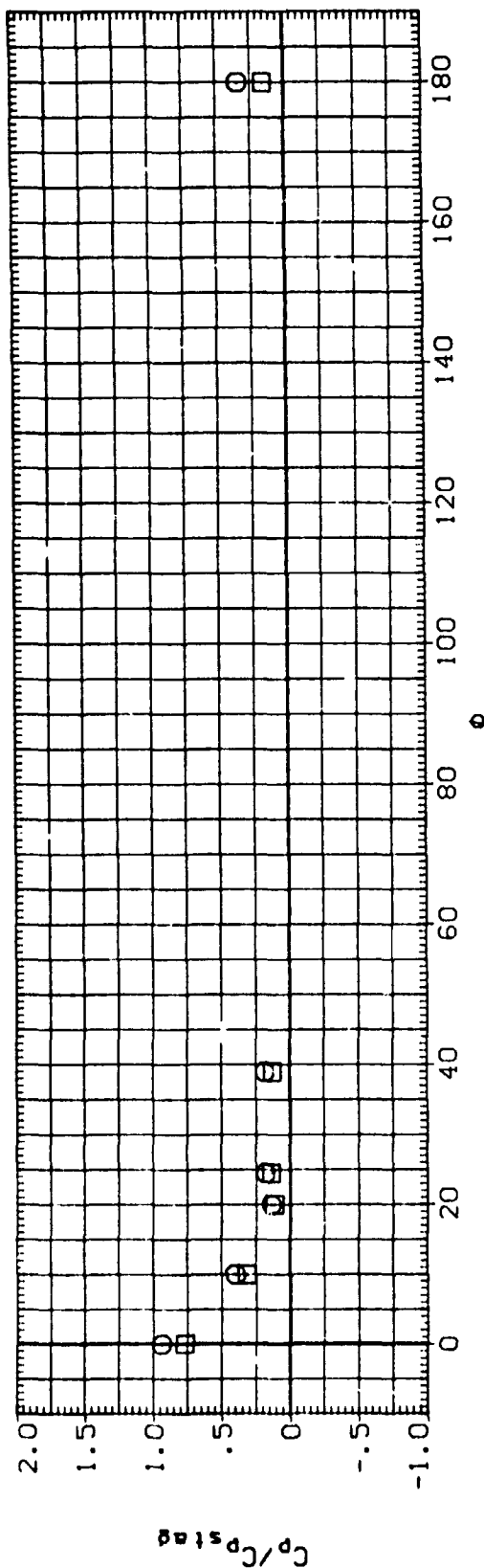


FIG. 4 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA=-5. RN/L= 3.0

(RQ3BAD) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA X/LB MACH
 -5.000 .500 3.700
 .000 .300

PARAMETRIC VALUES
 RN/L BETA
 3.000 -5.000

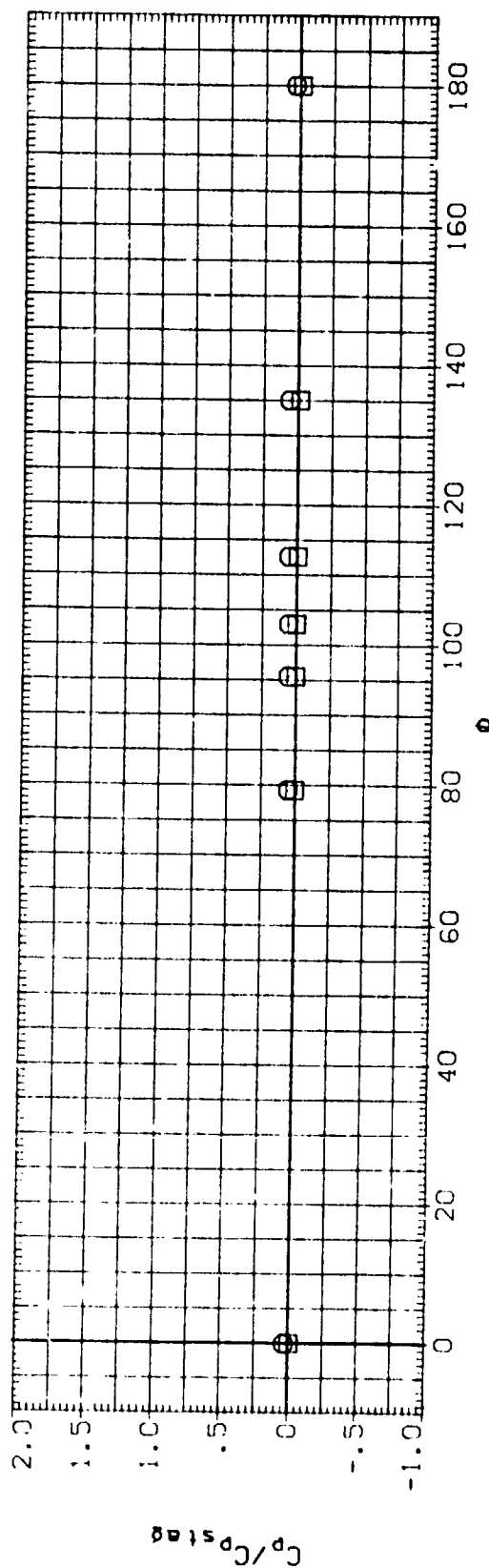
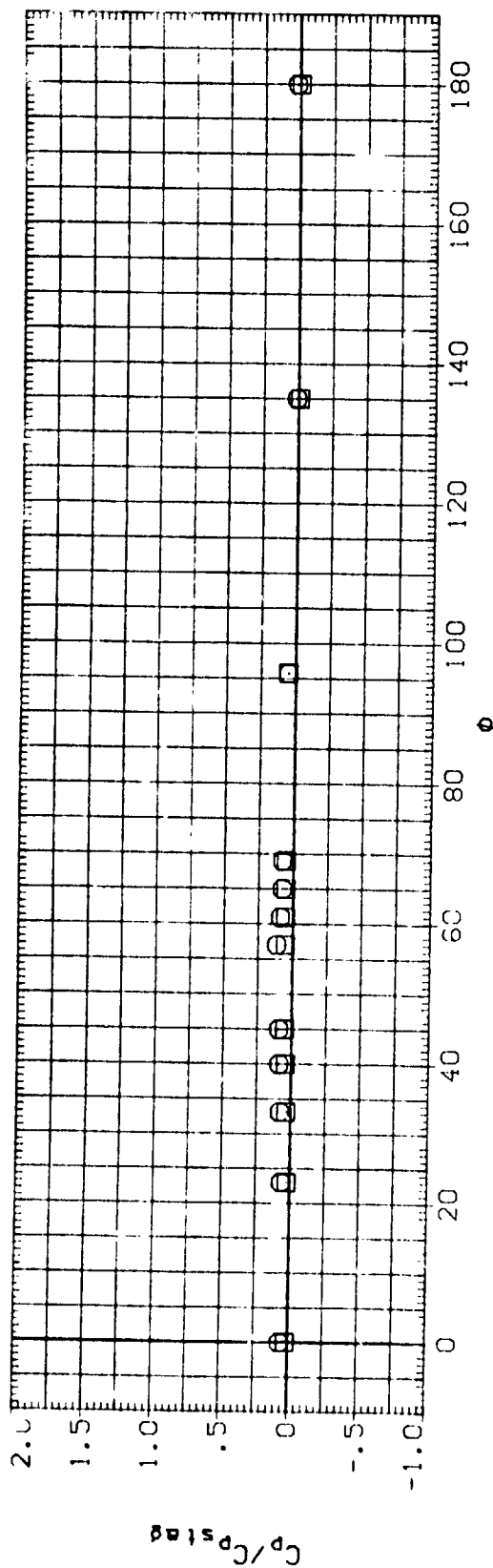


FIG. 4 VARIATION OF C_p/C_{pstd} ON THE INTEGRATED VEHICLE WITH T15, ORBITER FUSELAGE, BETA=-5, RN/L= 3.0

(RQ3BAD) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.200	4.500		3.000 BETA
	.000	.100			-5.000

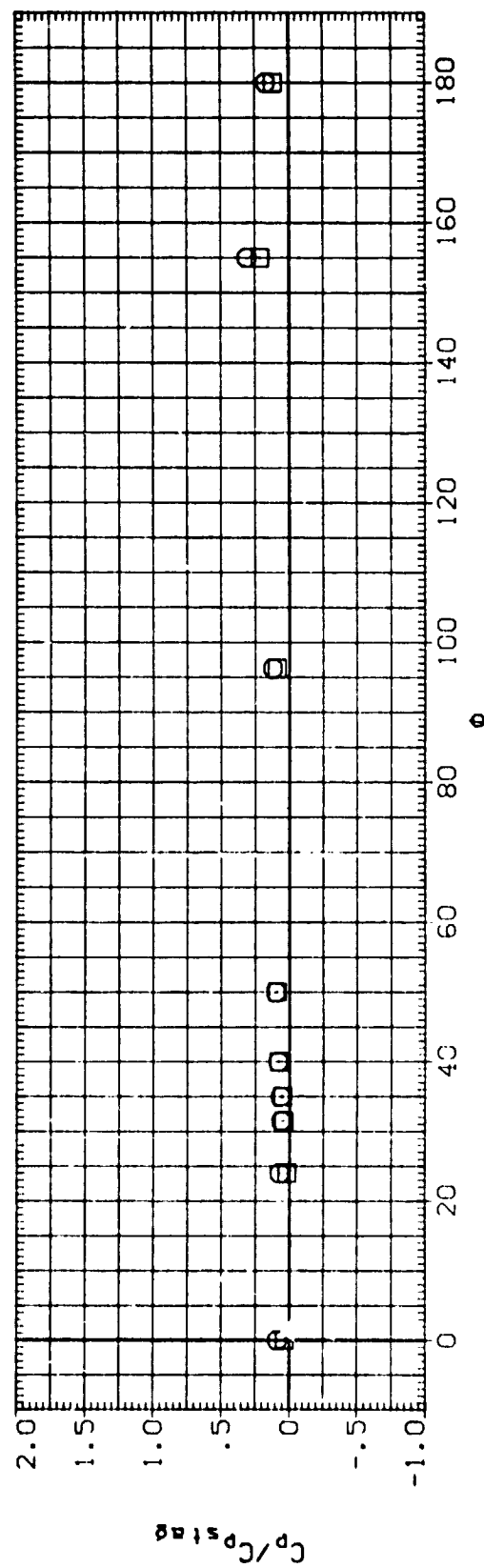
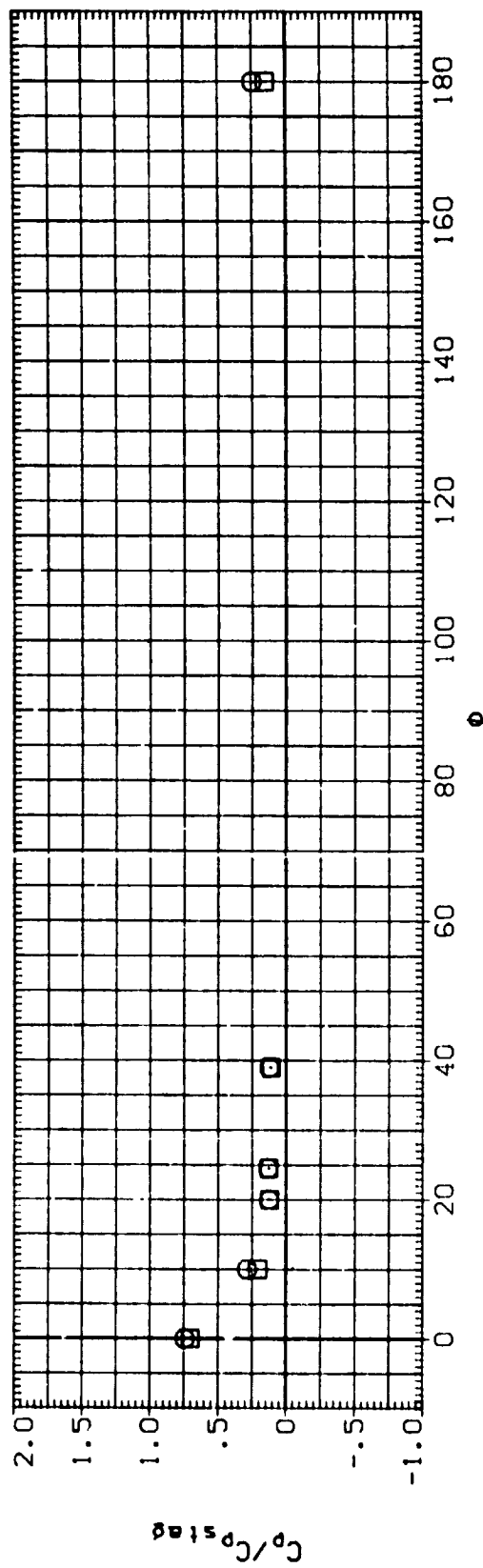


FIG. 4 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, ORBITER FUSELAGE. BETA=-5. RN/L = 3.0

(RQ3BAD) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

PARAMETRIC VALUES
3.000 BETA -5.000

RN/L

ALPHA
-5.000
.000

X/LB
.600
.300

MACH
4.600

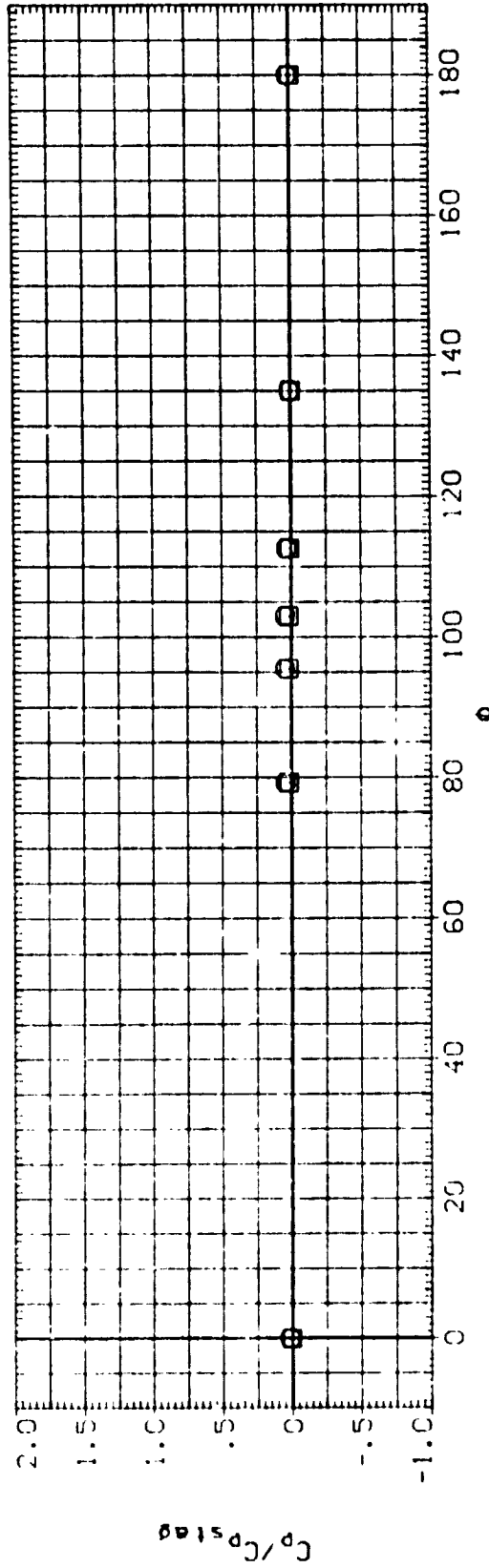
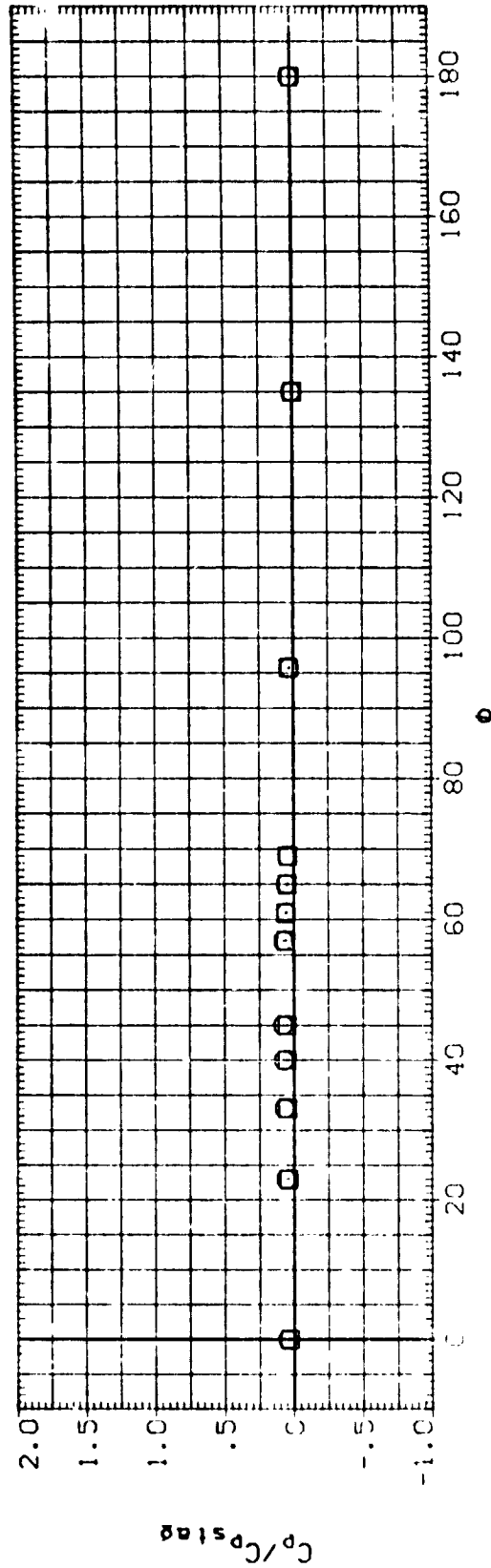


FIG. 4 VARIATION OF C_p/C_{pslag} ON THE INTEGRATED VEHICLE WITH T15, ORBITER FUSELAGE. BETA=-5. RN/L= 3.0

(R03LAD) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SV=BCL ALPHA
-5.000 .000

2V/BV
.400 .250

MACH
3.700

RN/L

PARAMETRIC VALUES
3.000 BETA

-5.000

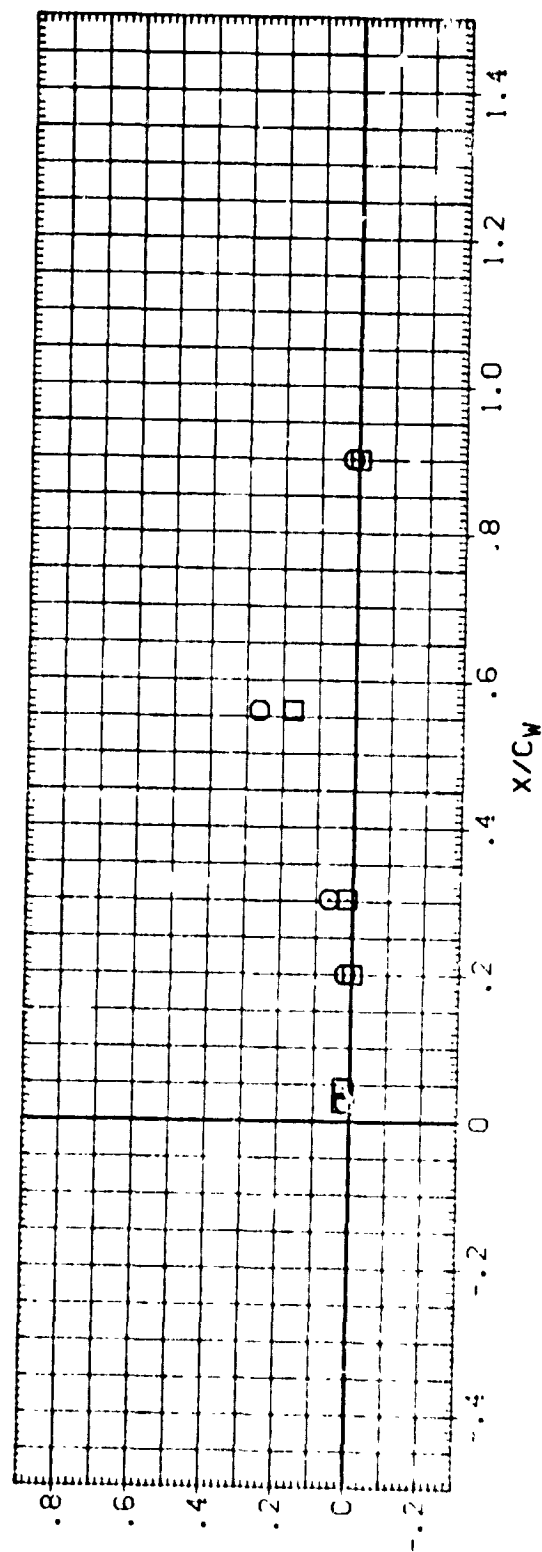
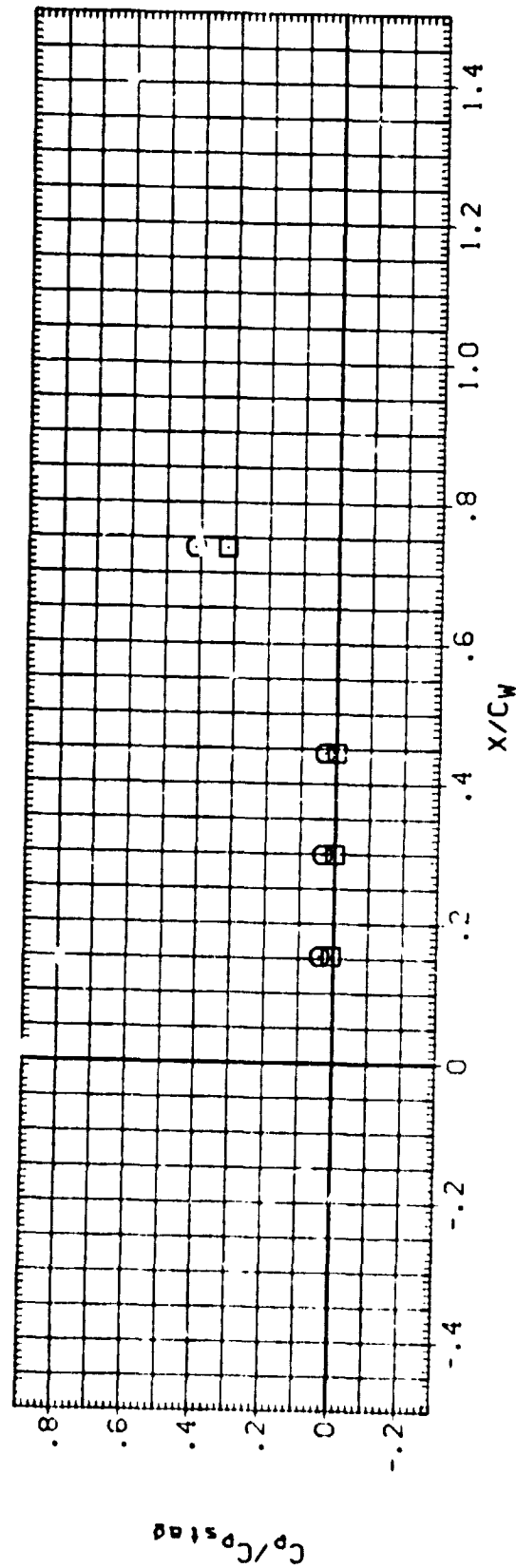


FIG. 5 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA=-5. RN/L= 3.0

(RG3LAD) UPWT 1059 (IH4) 01-T:5-S8N16 ORB. LOWER WING

PARAMETRIC VALUES
3.000 BETA -5.000
RN/L

SYMBOL ALPHA 2Y/BV MACH
-5.000 .600 3.700
.000 .500

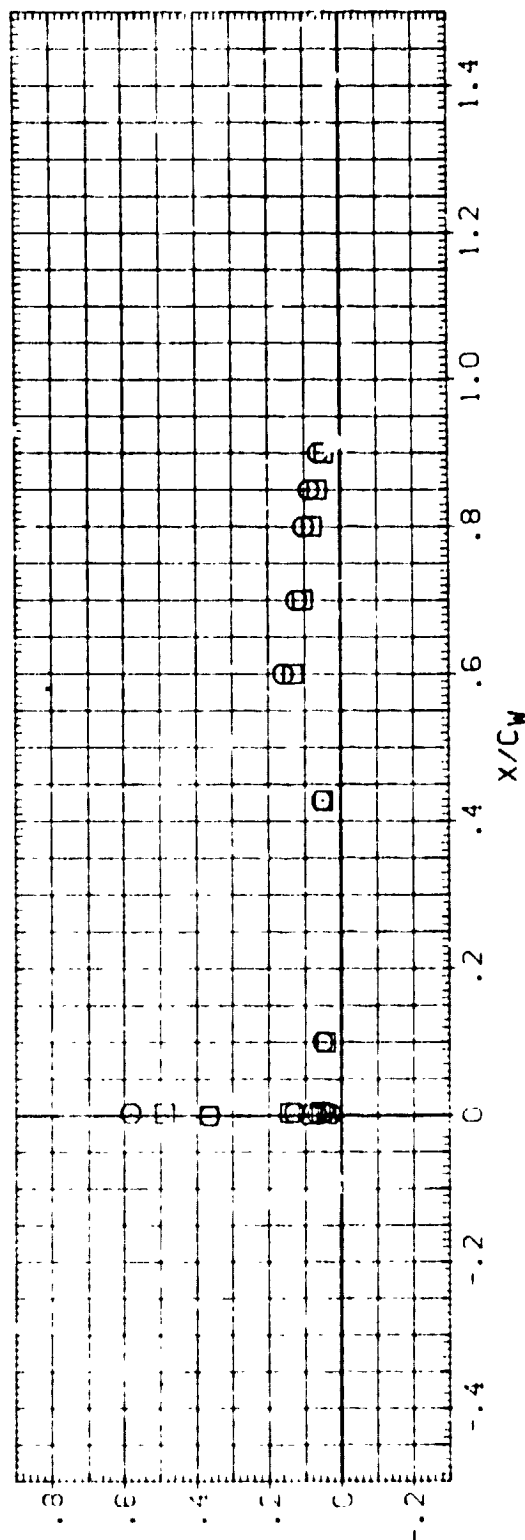
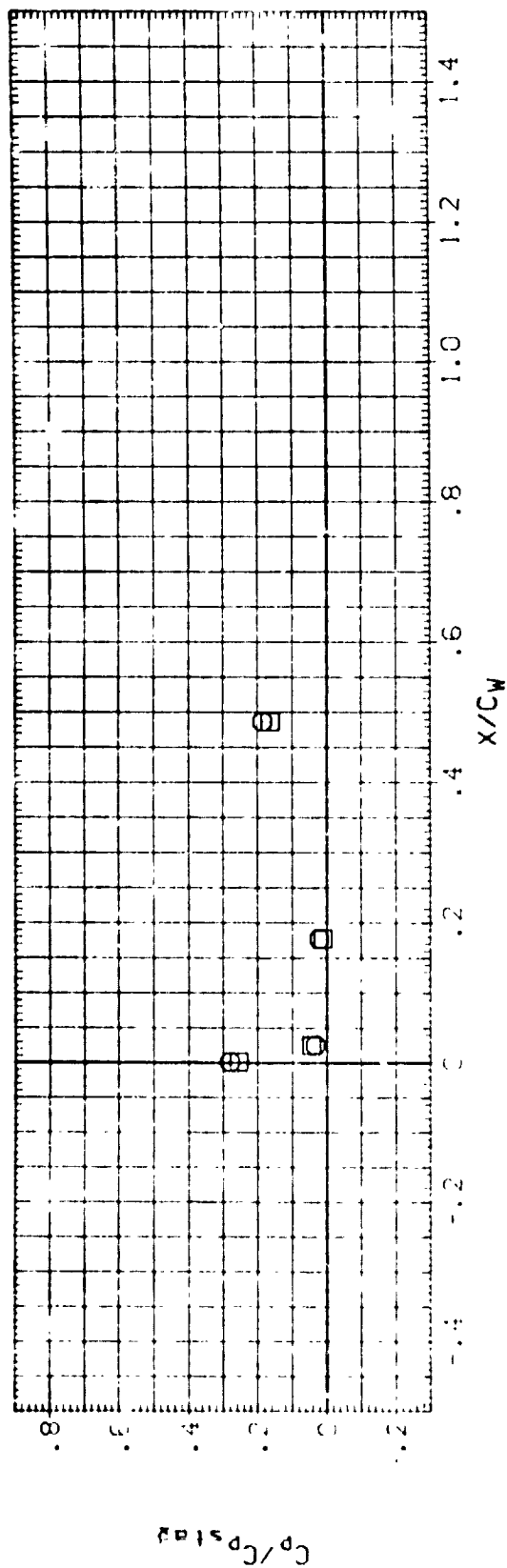


FIG. 5 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA=-5. RN/L= 3.0

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(RQ3LAD) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2V/BW	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.850	3.700		3.000 BETA
	.000	.750			-5.000

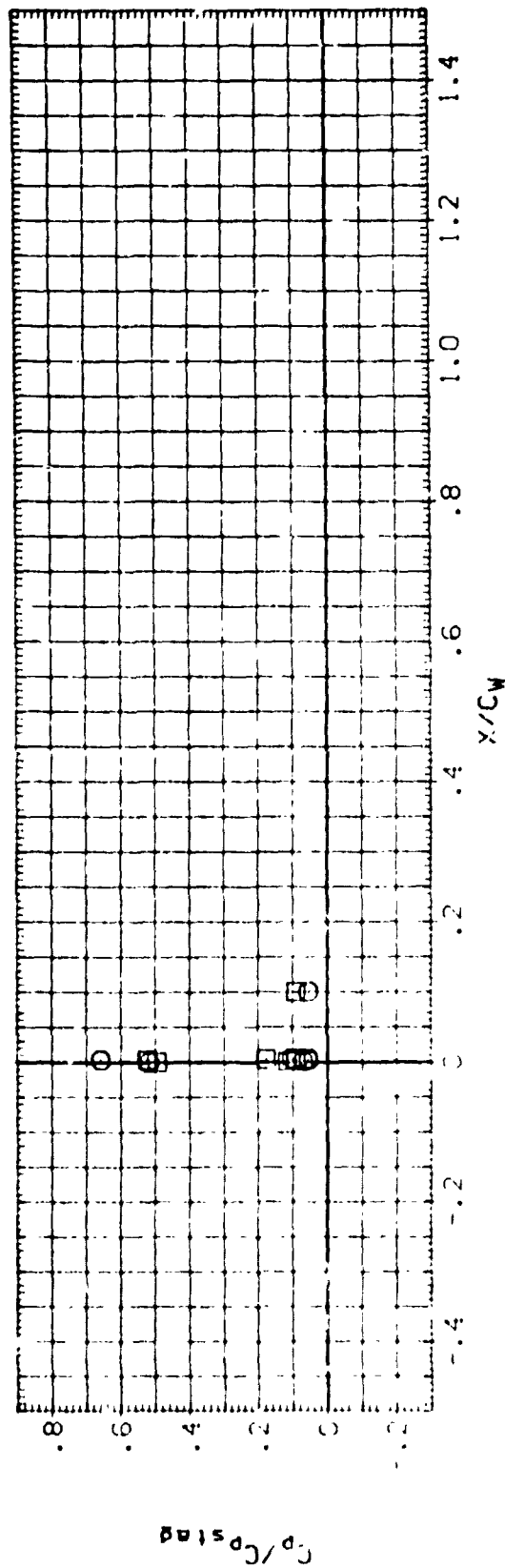
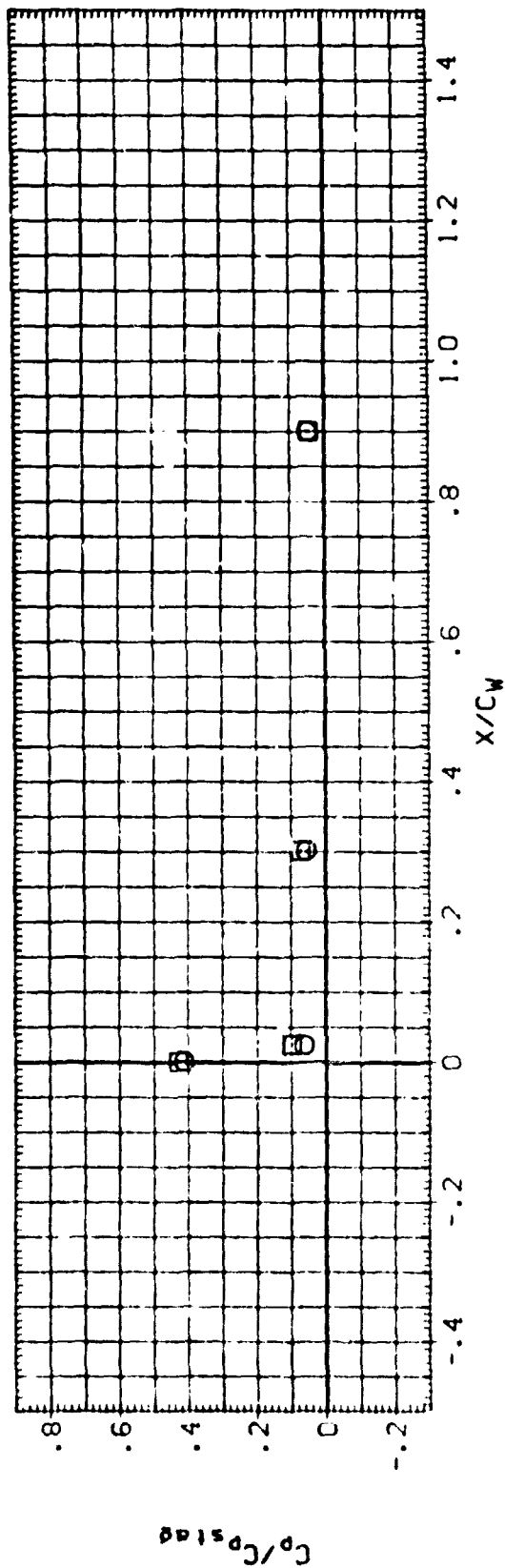


FIG. 5 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA=-5. RN/L= 3.0

(R03LAD) UPWT 1059 (IH4) C1-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 21/BW MACN
 -5.000 .400 4.500
 .000 .250

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

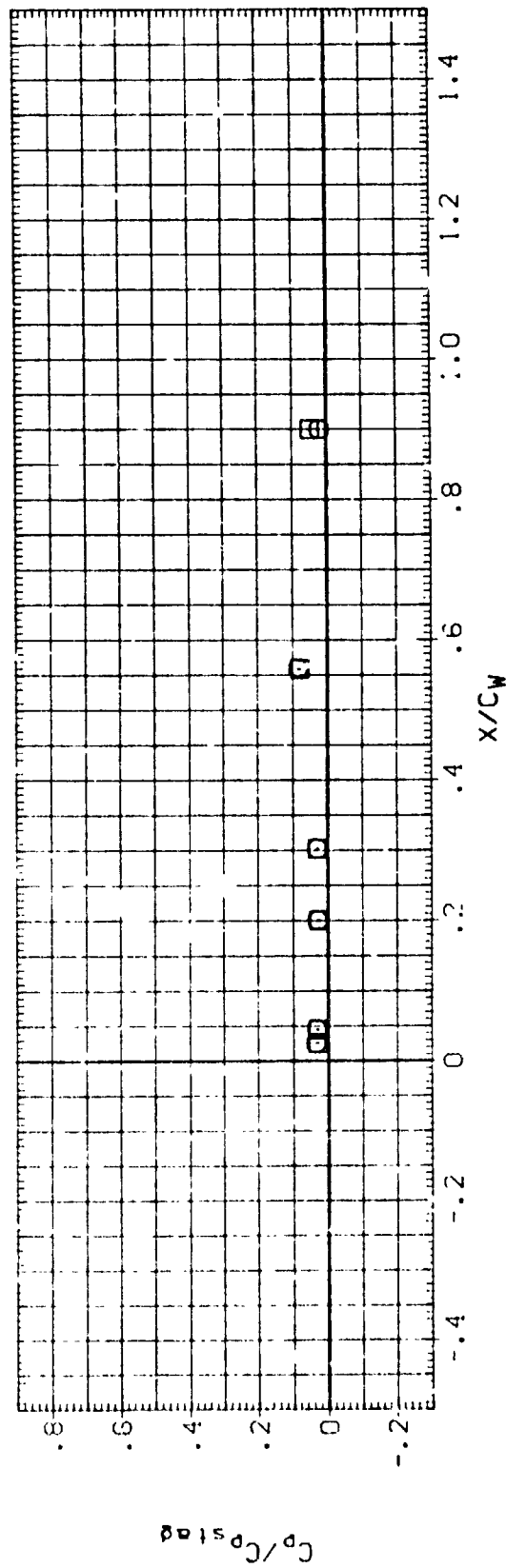
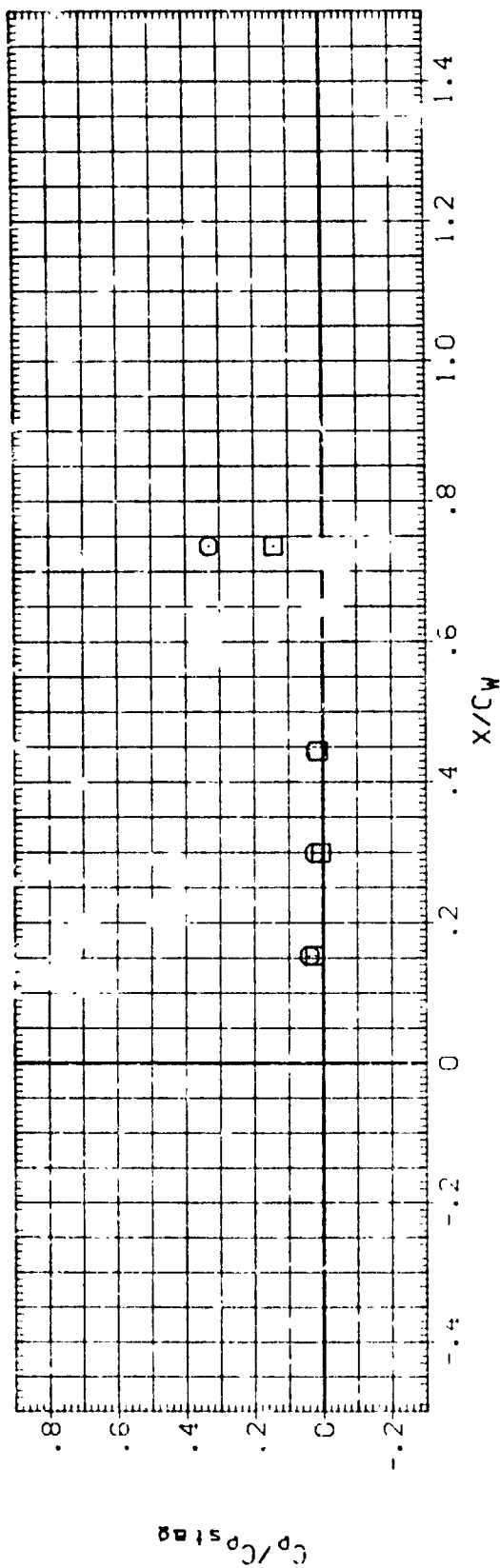


FIG. 5 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA=-5. RN/L= 3.0

(RQ3LAD) UPWT 1059 (IP) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA
-5.000
.000

2V/BW MACH
.500 4.500

RN/L

PARAMETRIC VALUES
3.000 BETA

-5.000

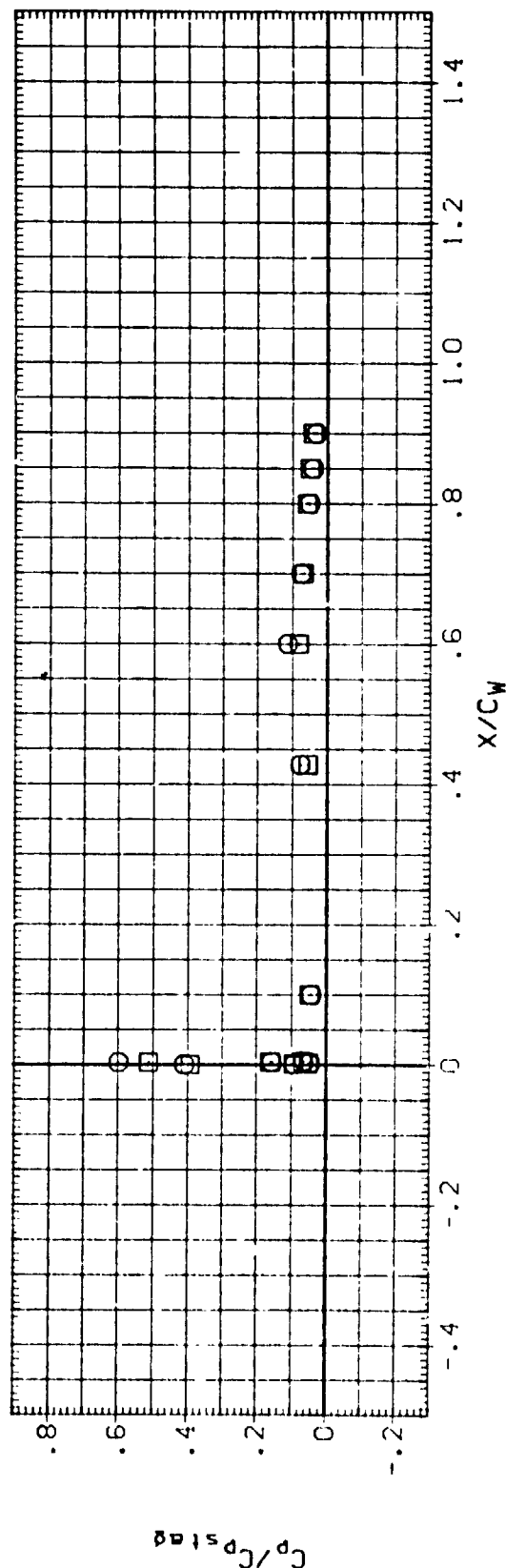
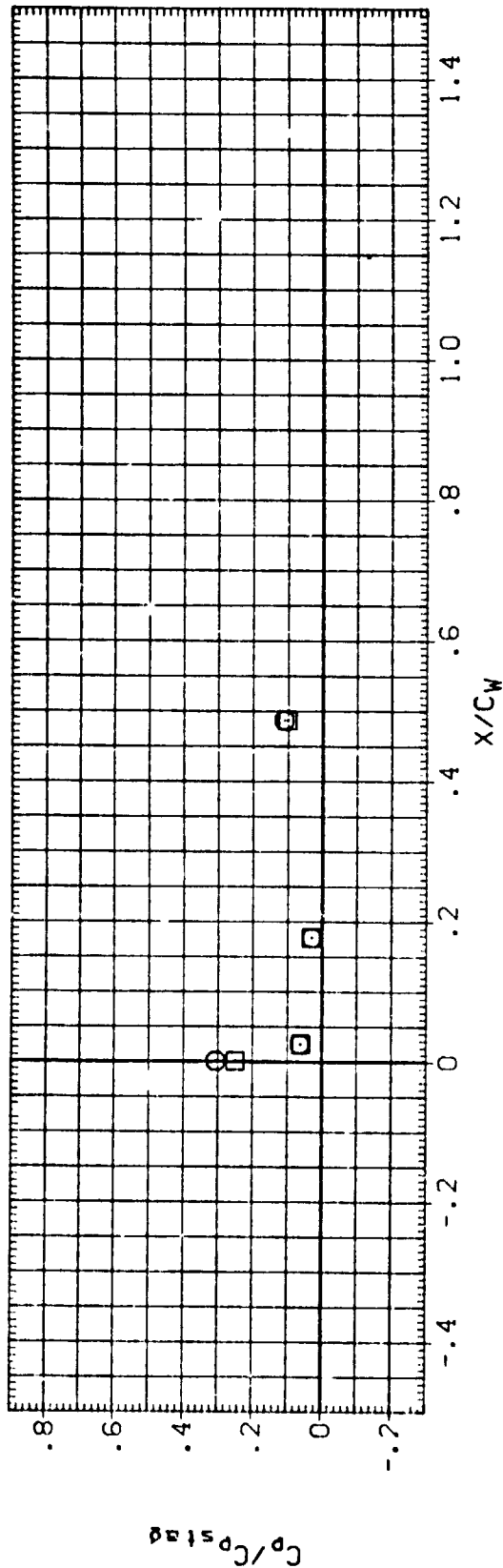


FIG. 5 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA=-5. RN/L= 3.0

(RQ3LAD) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING
 SYMBOL ALPHA 2Y/BW MACH
 -3.000 .850 4.600
 .000 .750

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

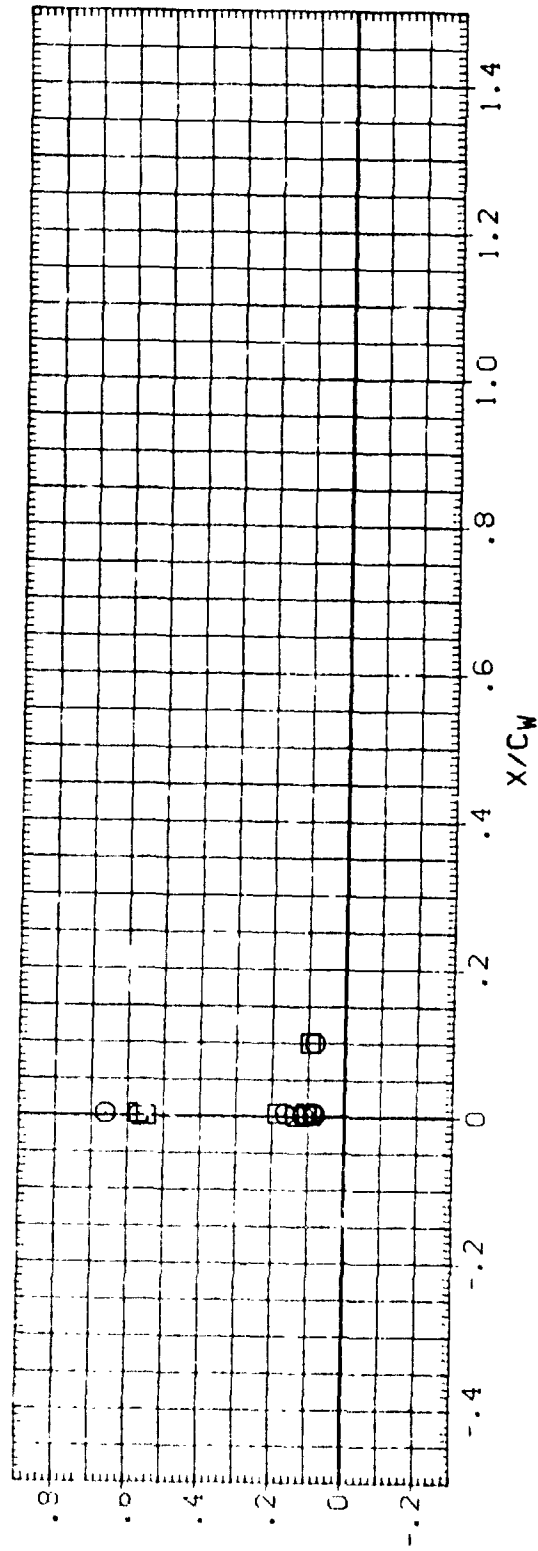
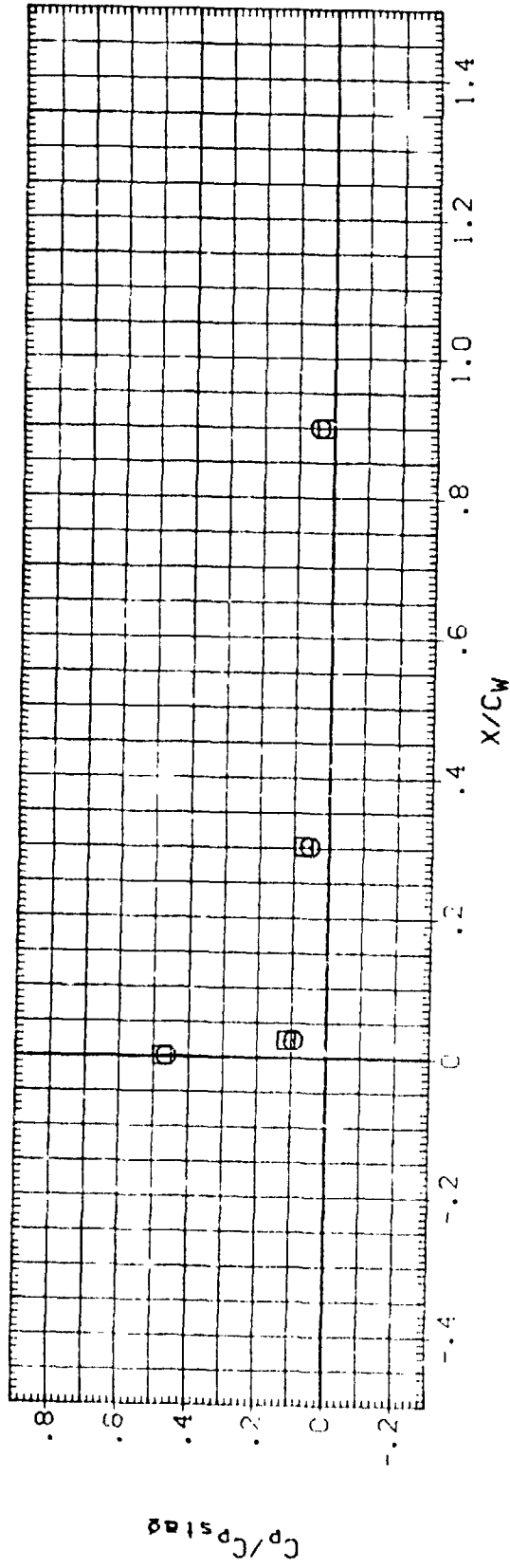


FIG. 5 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA=-5. RN/L= 3.0

(R03JAD) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL ALPHA 2Y/BW MACH
 -5.000 .800 3.700
 .000 .600
 .400

PARAMETRIC VALUES
 3.000 BETA -5.000
 RN/L

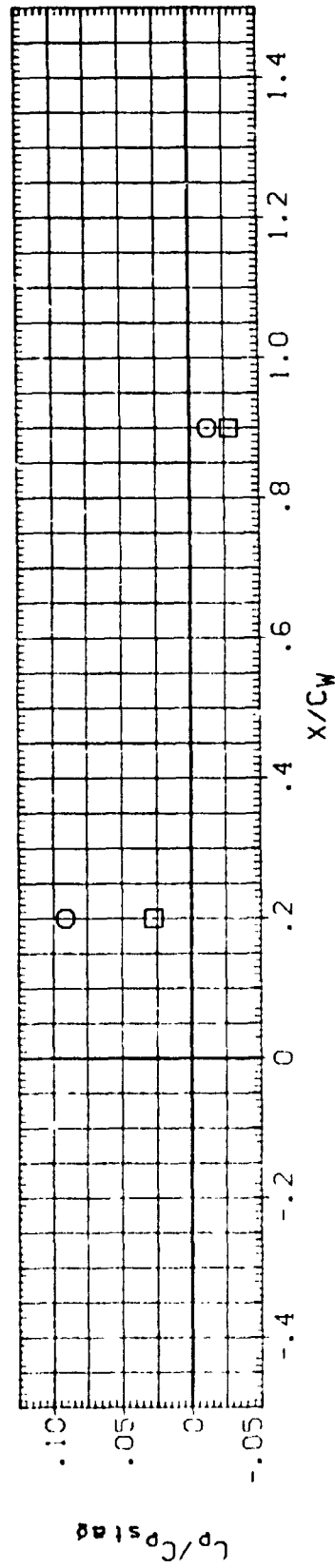
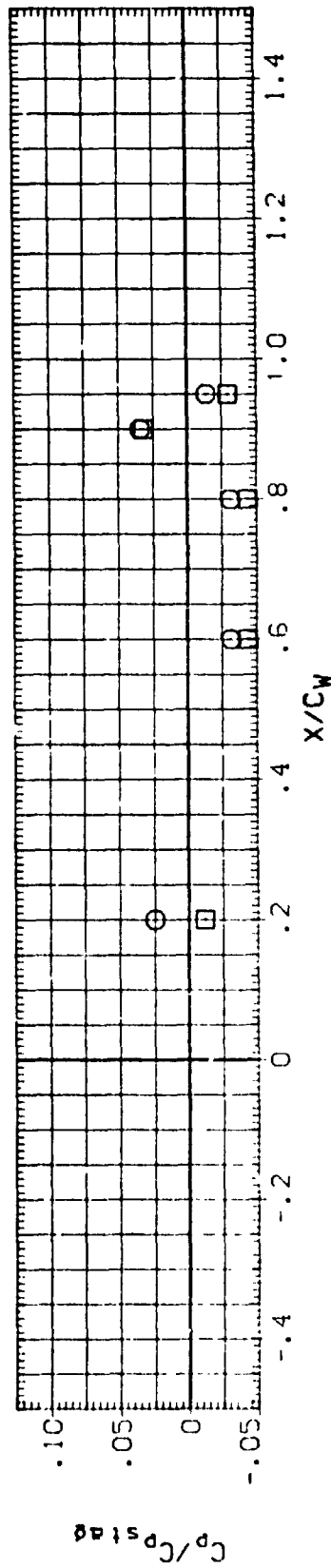
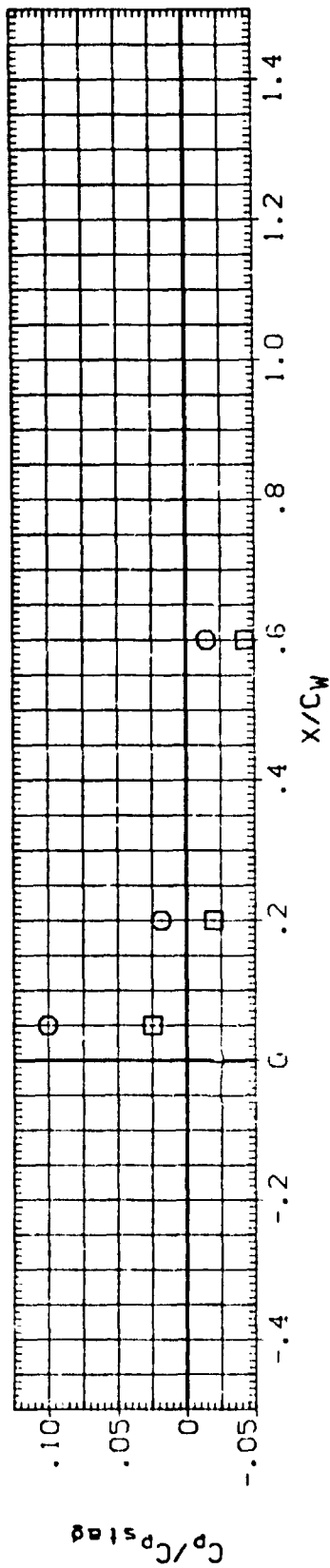


FIG. 6 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING. BETA=-5. RN/L= 3.0

(RQ3UAD) UPWT 1059 (IH4) 01-T15-S8N16 OR8. UPPER WING

SYMBOL ALPHA 2Y/BV MACH
 -5.000 .800 4.600
 .000 .600 .400

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

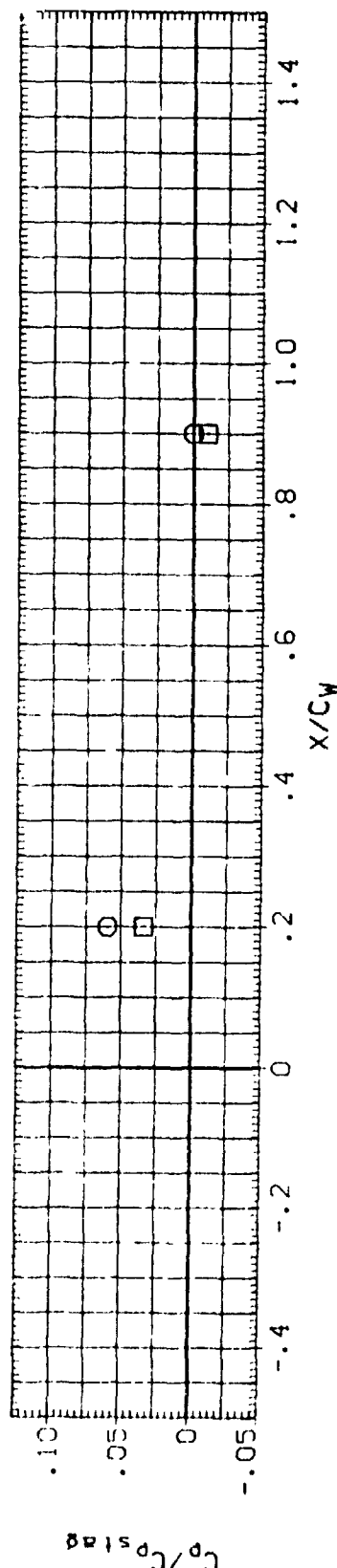
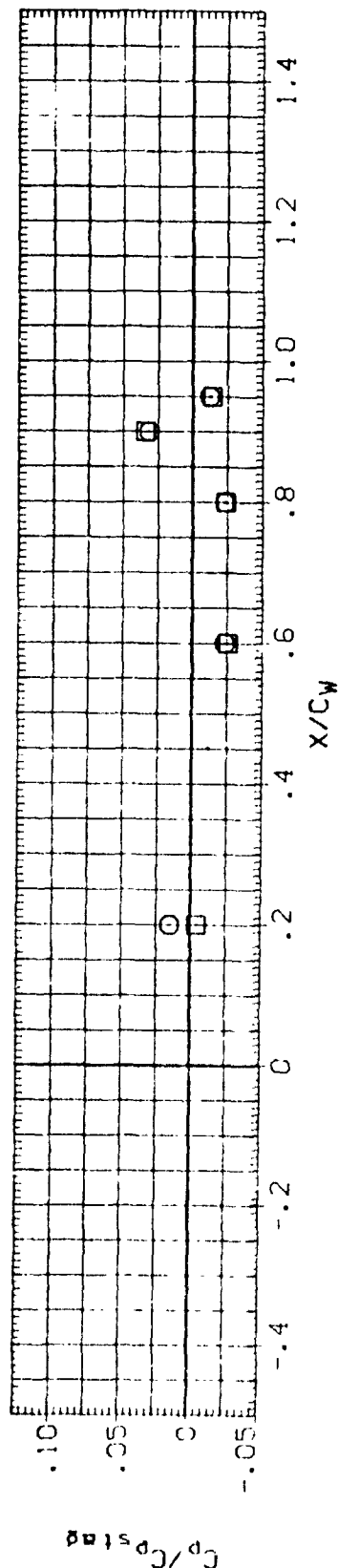
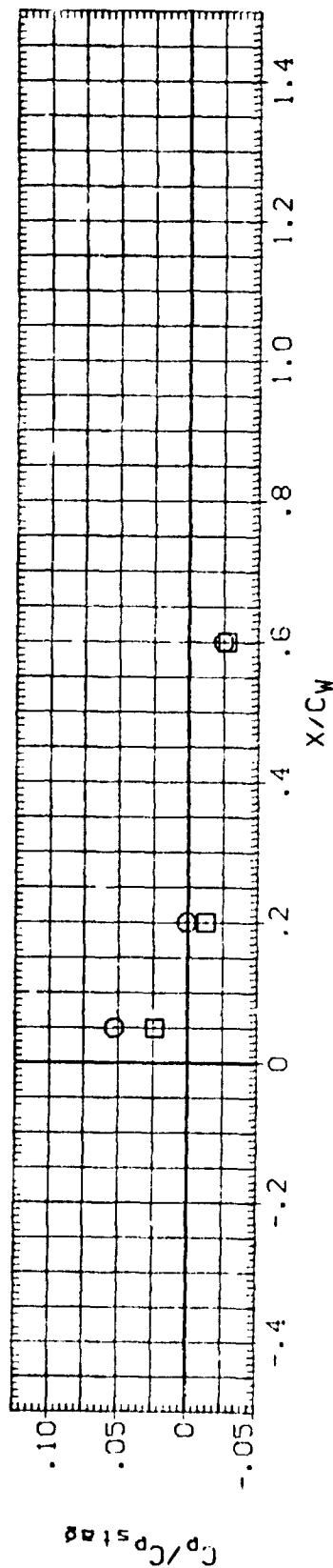


FIG. 6 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING. BETA=-5. RN/L= 3.0

(R03VAD) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL \square \circ

ALPHA
-5.000
.000
.532
.765

Z/CV
MACH
3.700

RN/L

PARAMETRIC VALUES
3.000 BETA

-5.000

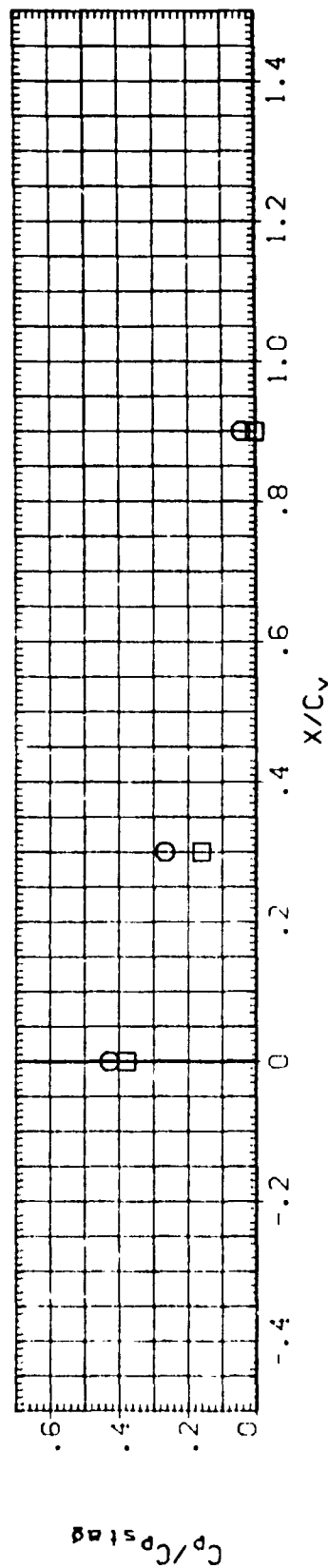
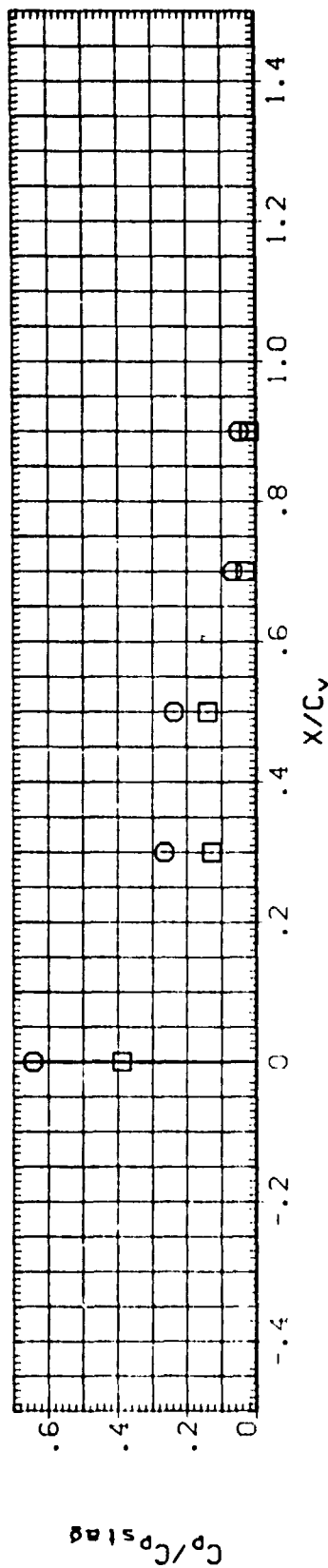
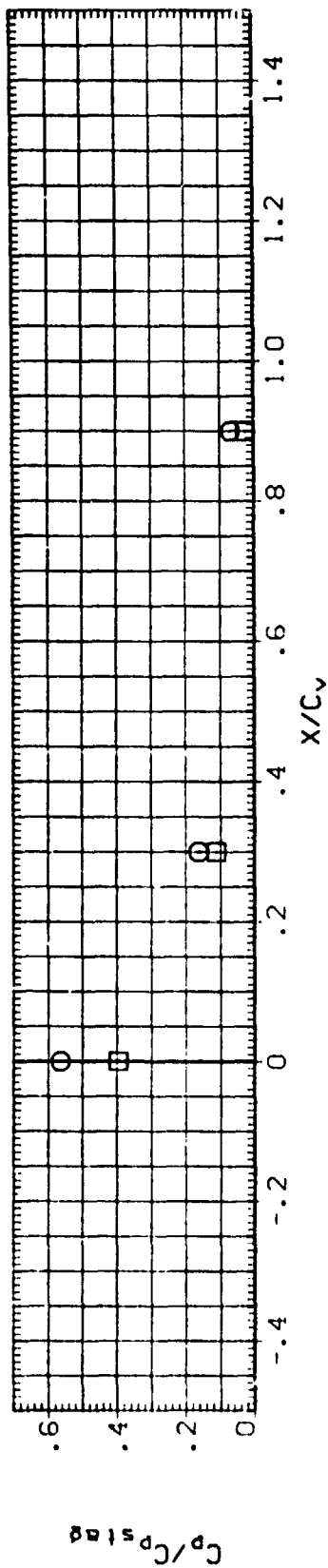


FIG. 7 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER
VERTICAL TAIL. BETA=-5, RN/L= 3.0

(RQ3VAD) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL ALPHA Z/BV MACH
 -5.000 .299 4.600
 .000 .532
 .765

PARAMETRIC VALUES
 3.000 BETA -5.000

RN/L

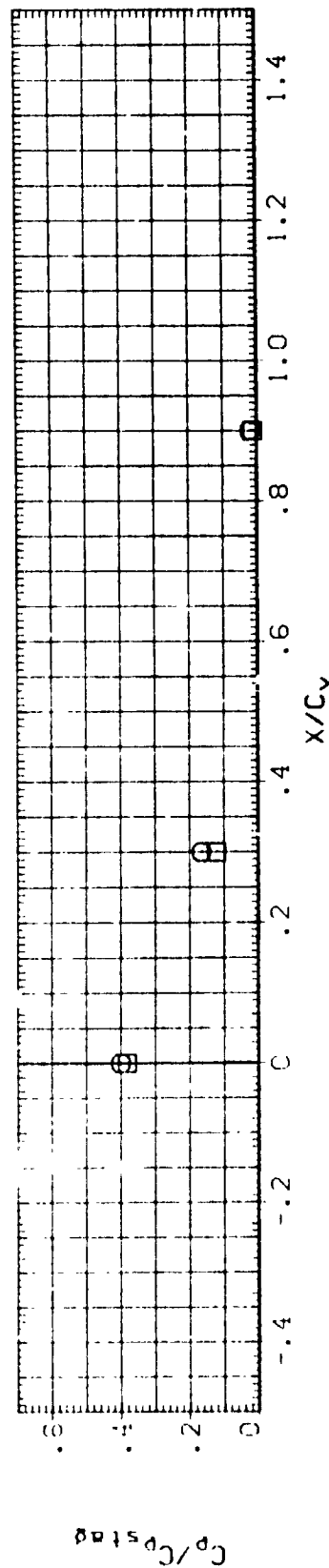
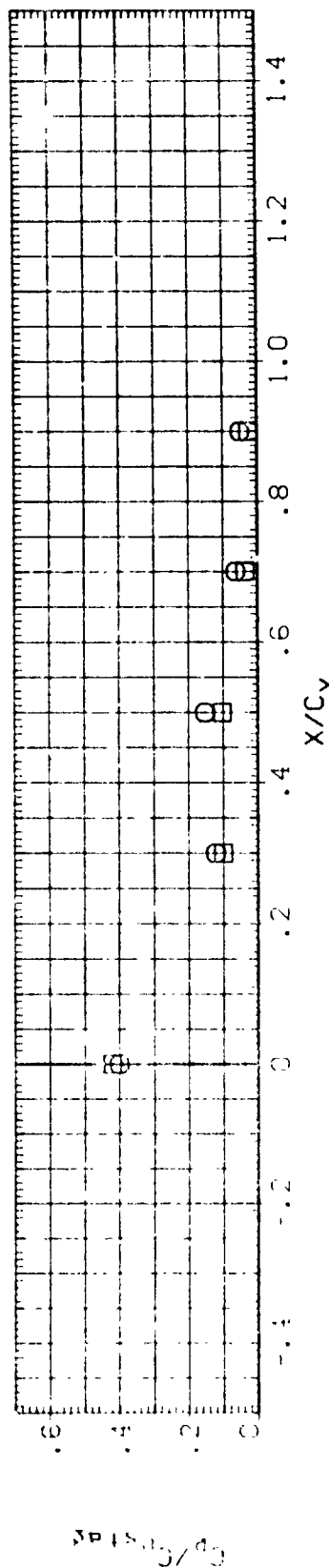
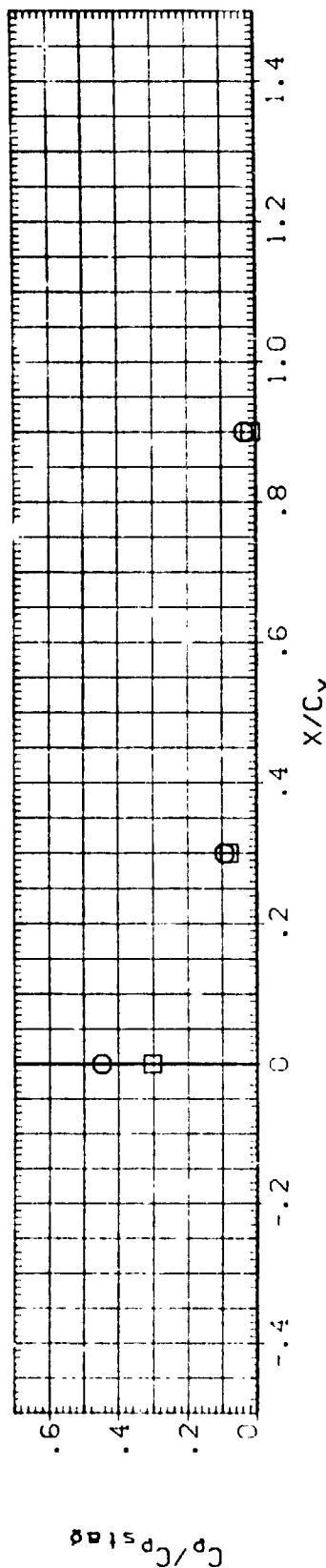


FIG. 7 VARIATION OF C_p/C_{pstd} ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA=-5, RN/L= 3.0

(R03TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 □ -5.000 67.500 3.700
 ○ .000 .000 .000

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

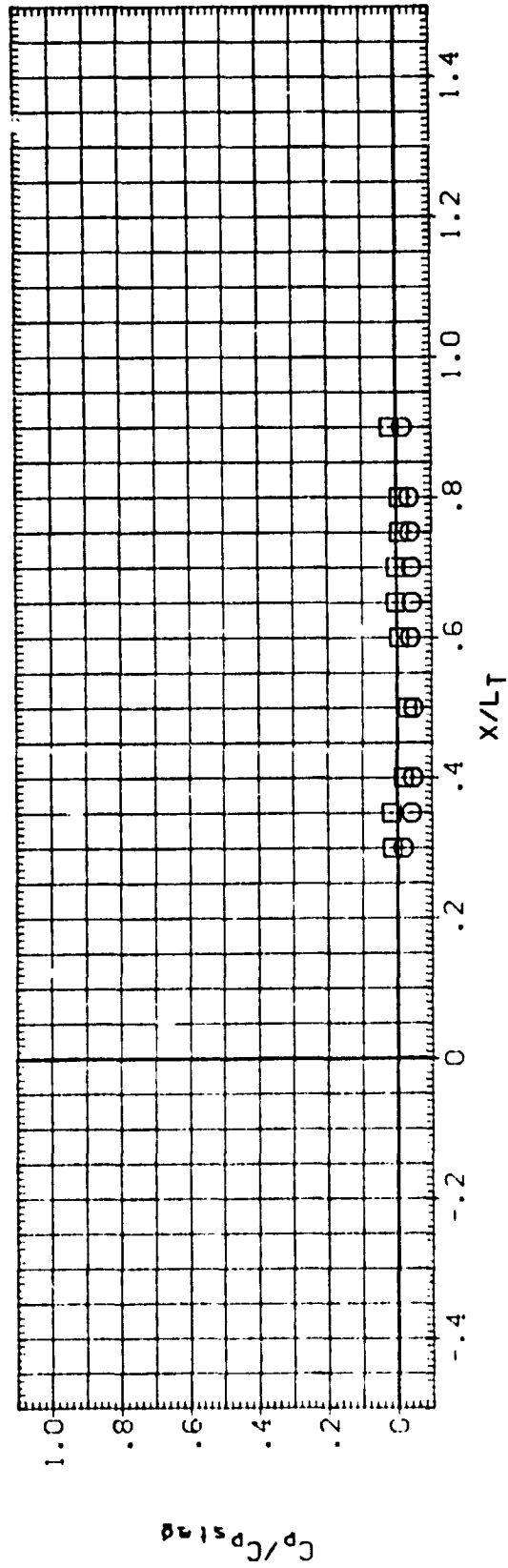
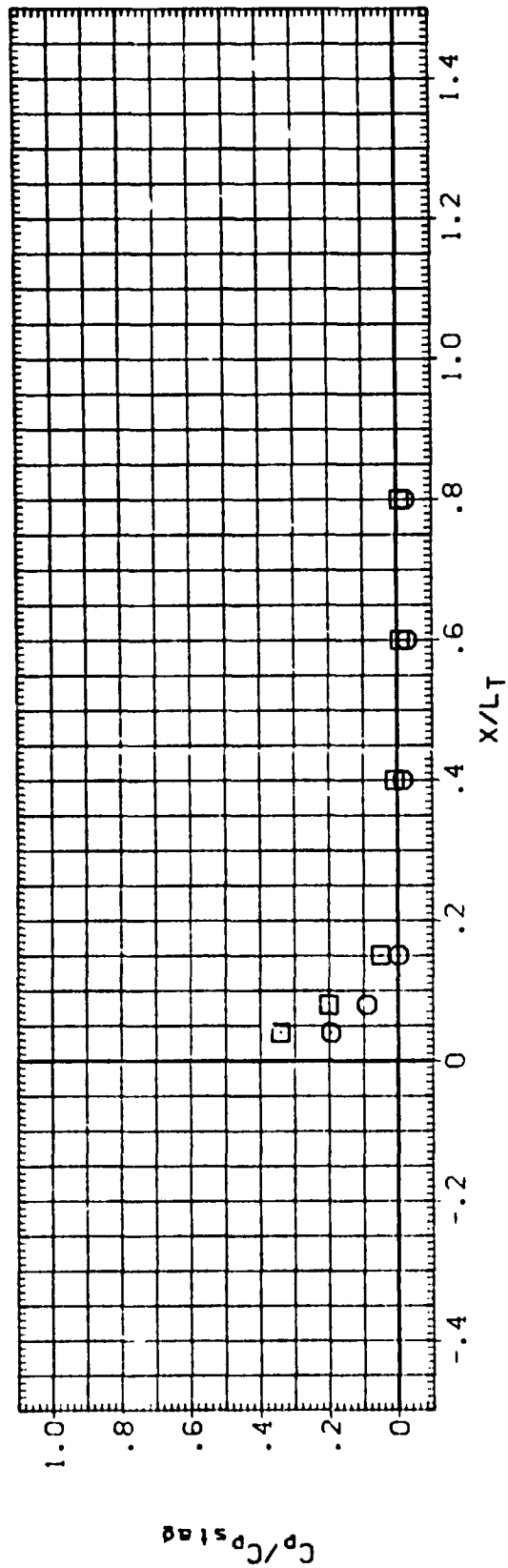


FIG. 3 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5, RN/L= 3.0

(R03TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -5.000 112.500 3.700
 .000 90.000

PARAMETRIC VALUES
 RN/L BETA -5.000

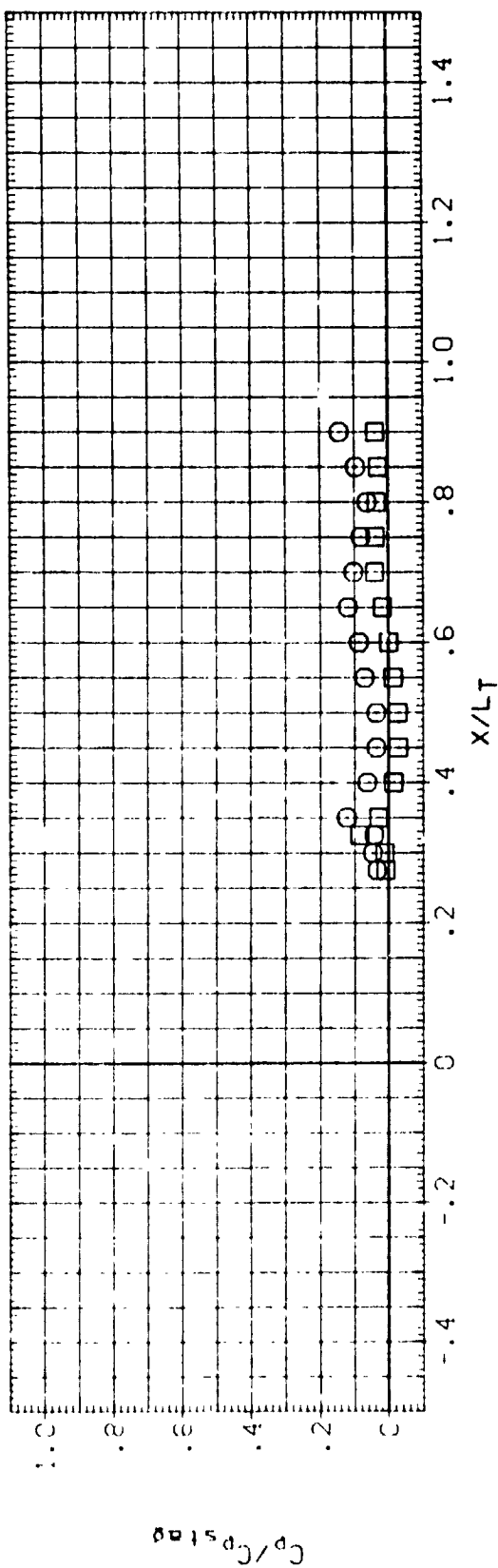
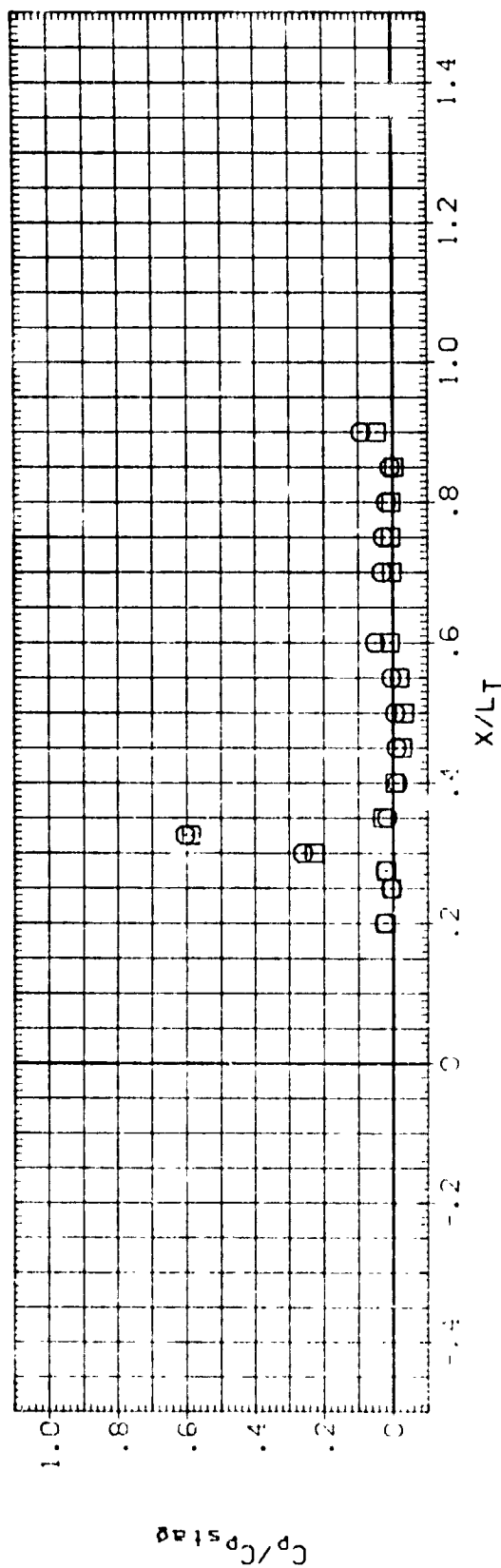


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

(;Q3TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

ALPHA MACH
-5.000 135.000
-5.000 123.000

PARAMETRIC VALUES
3.000 BETA -5.000
RN/L

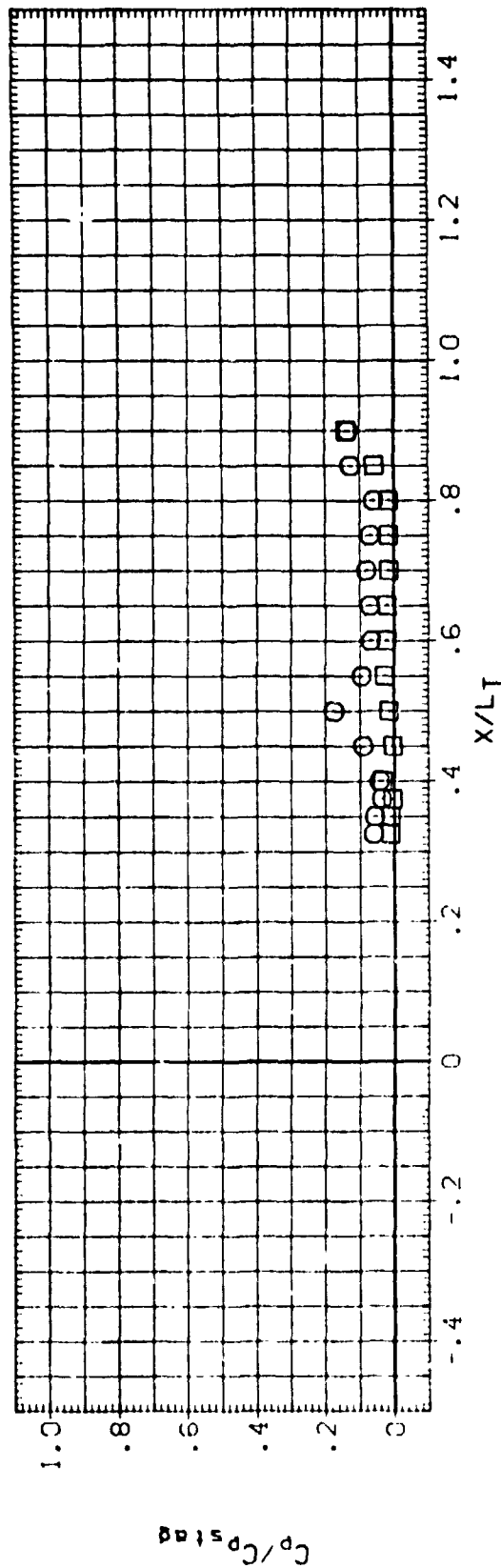
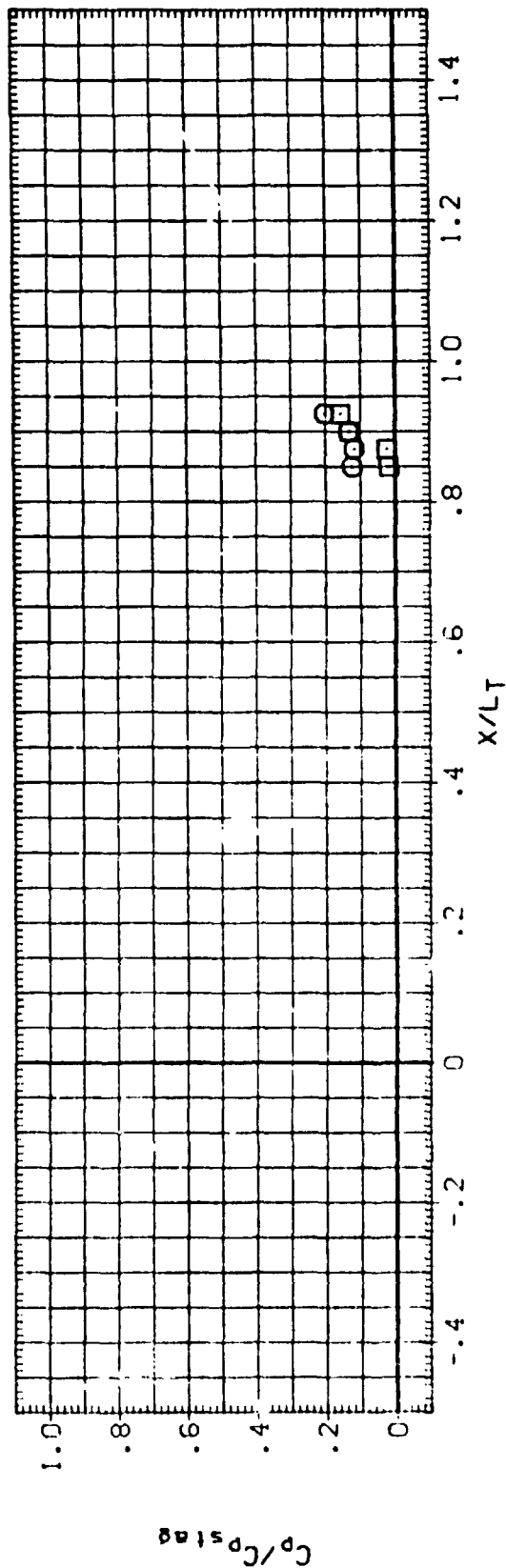


FIG. 8 VARIATION OF C_p/C_{pstag} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

[RQ3TAD] UPWT 1059 (IH4) 01-T:5-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -5.000 180.000 3.700
 .000 157.500

PARAMETRIC VALUES
 3.000 BETA
 -5.000

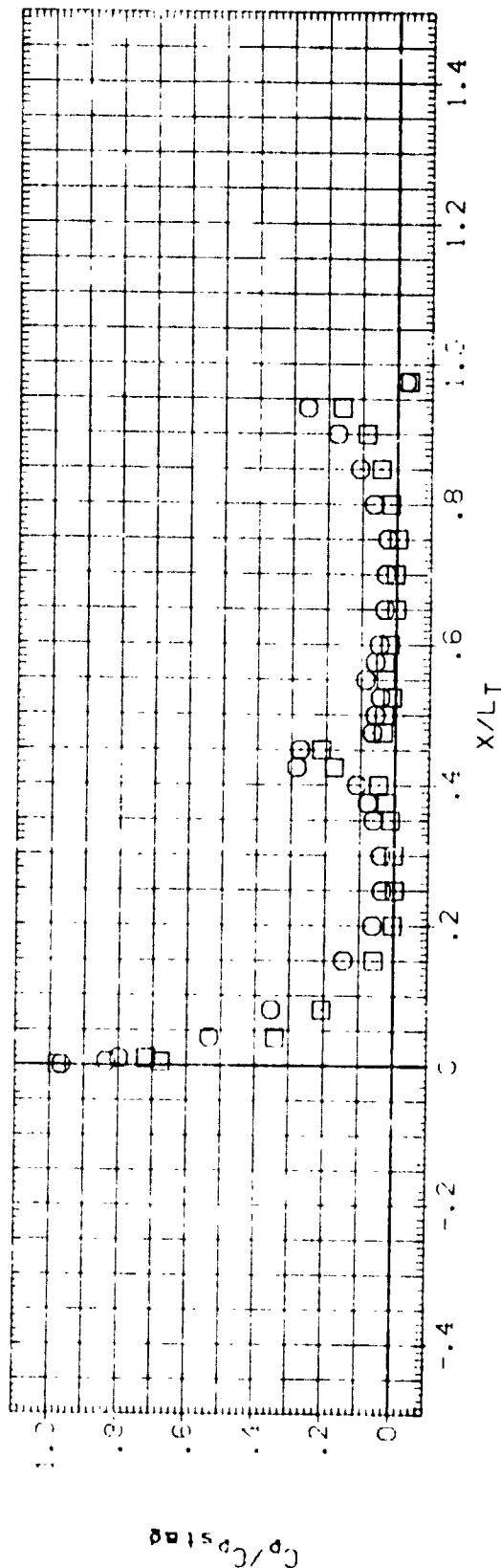
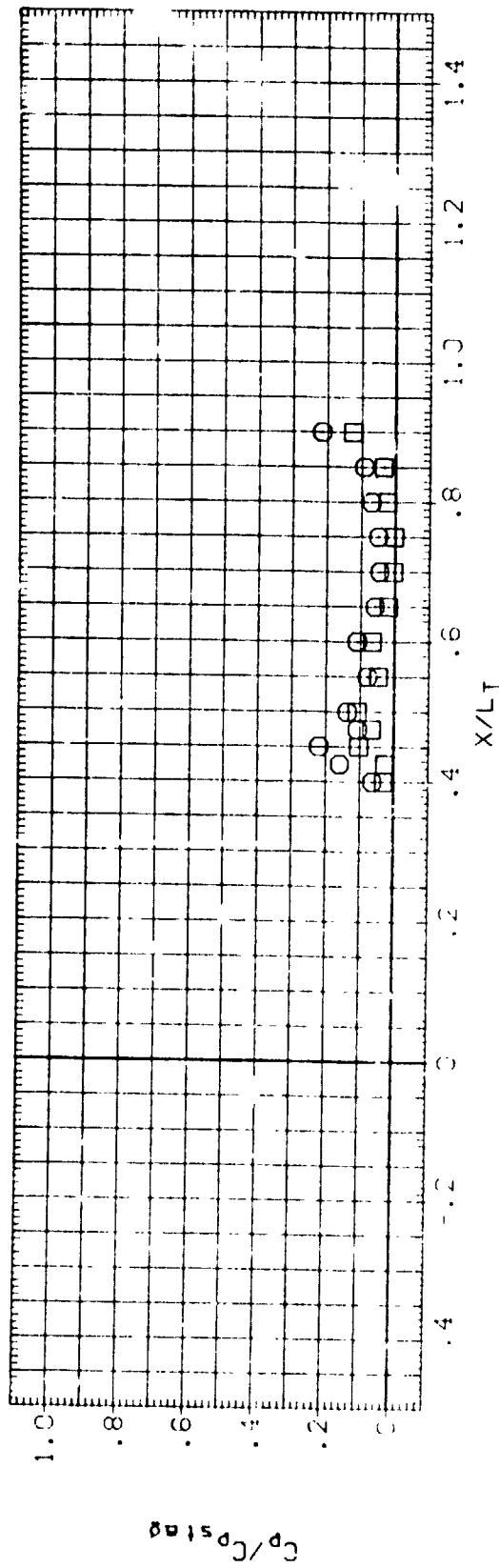


FIG. 8 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK, BETA=-5, RN/L=3.C

(R03TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA T-BETA MACH
 0 -5.000 210.000 3.700
 1 .000 197.000

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

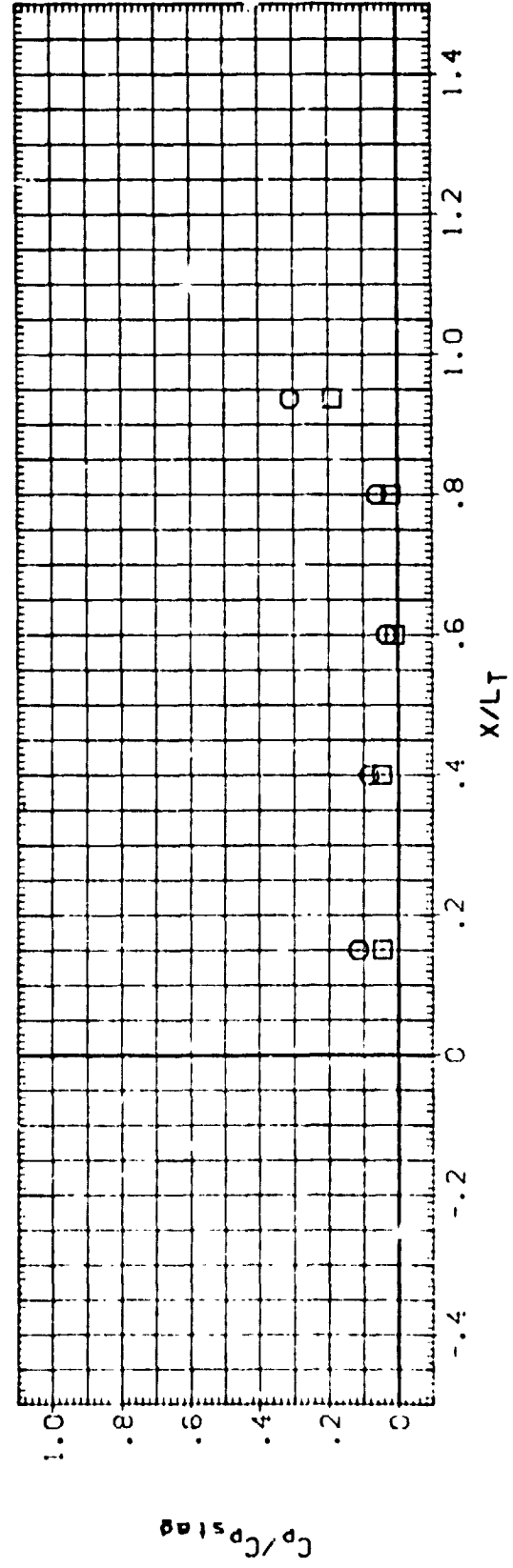
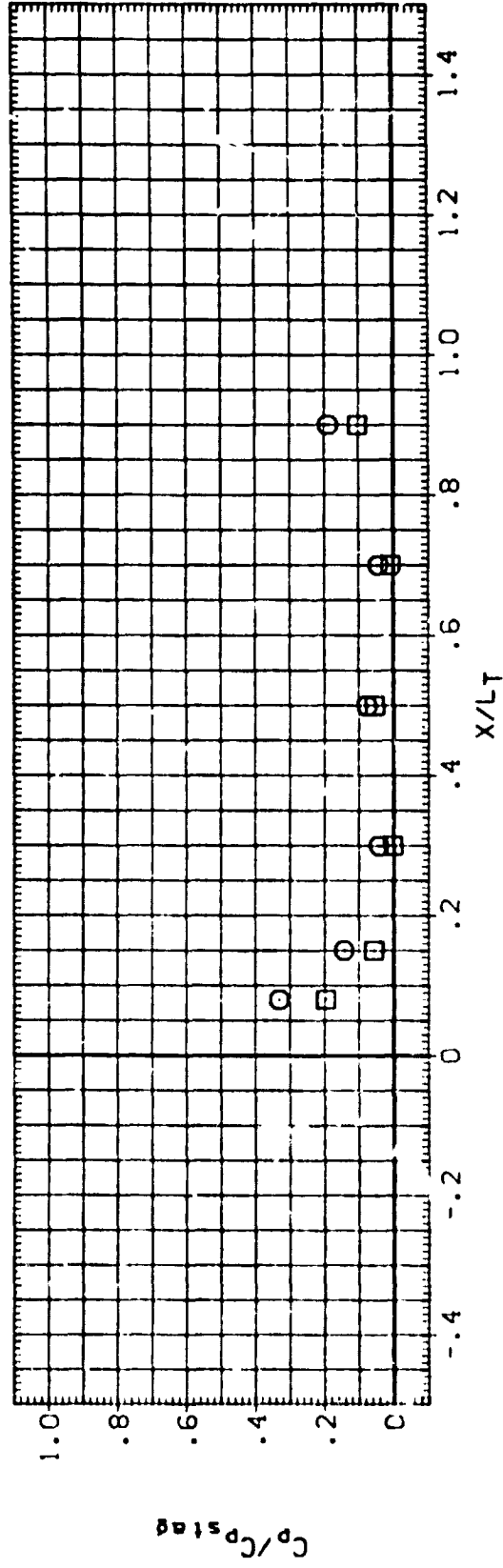


FIG. 8 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

(RQ3TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -5.000 67.500 4.000
 .000

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

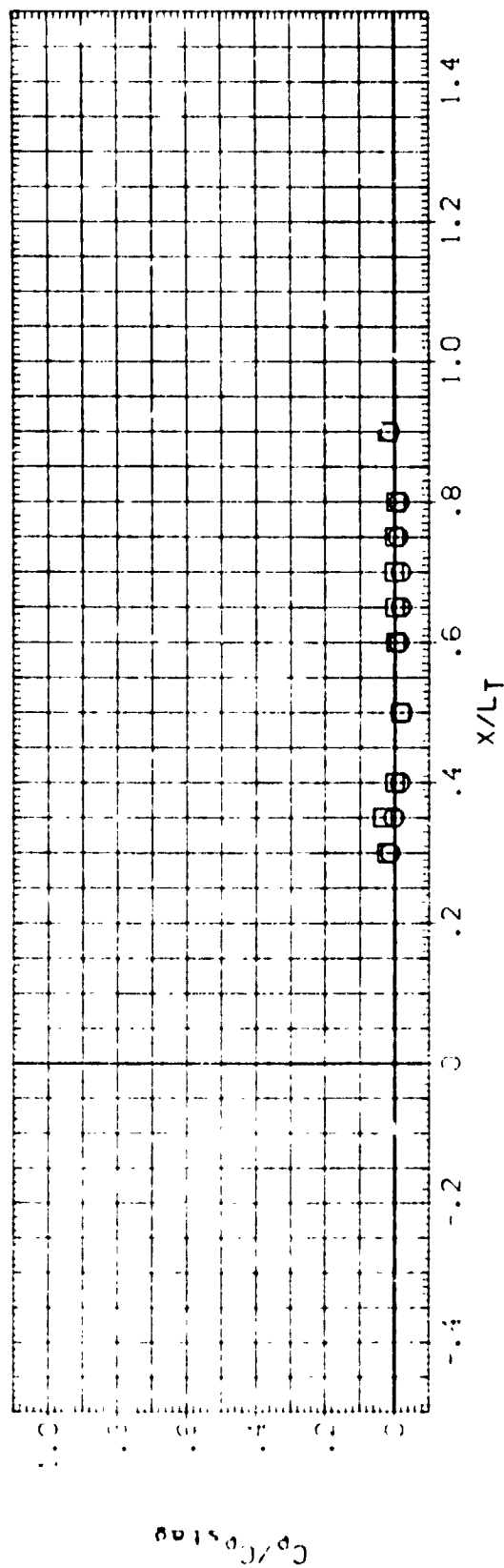
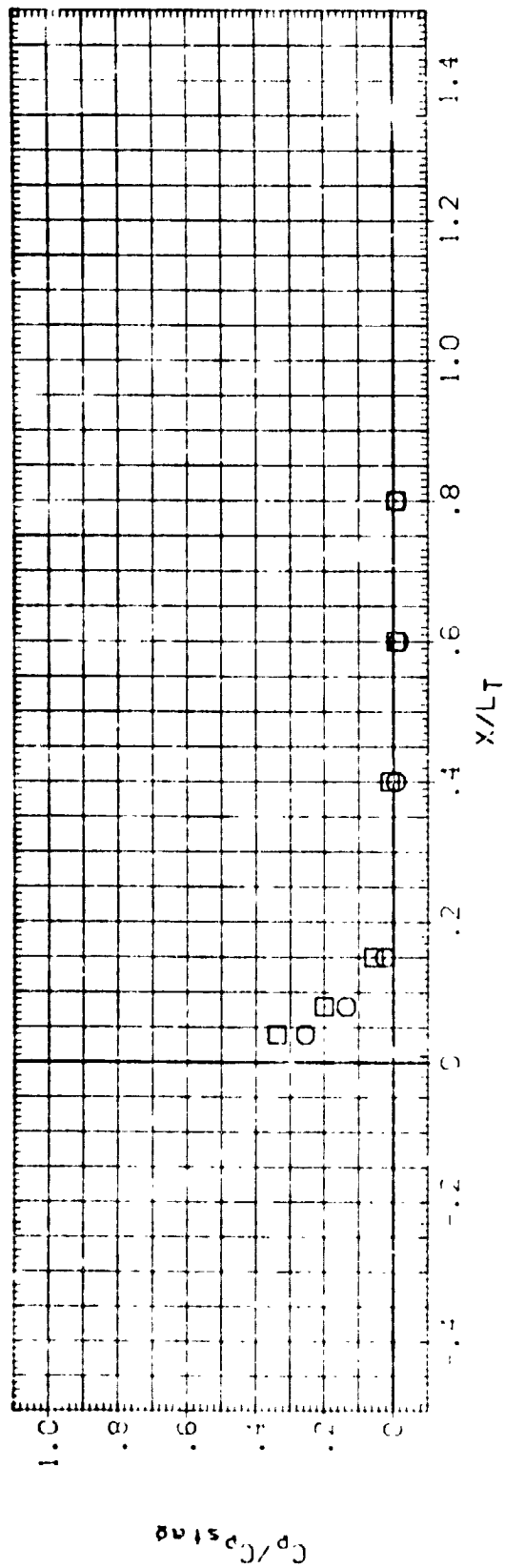


FIG. 8 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

(R03TA0) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL α_{PWA} θ_{ETA} θ_{CH}
 -5.000 112.500 4.500
 .000 90.000

PARAMETRIC VALUES
 3.000 BETA -5.000

RN/L

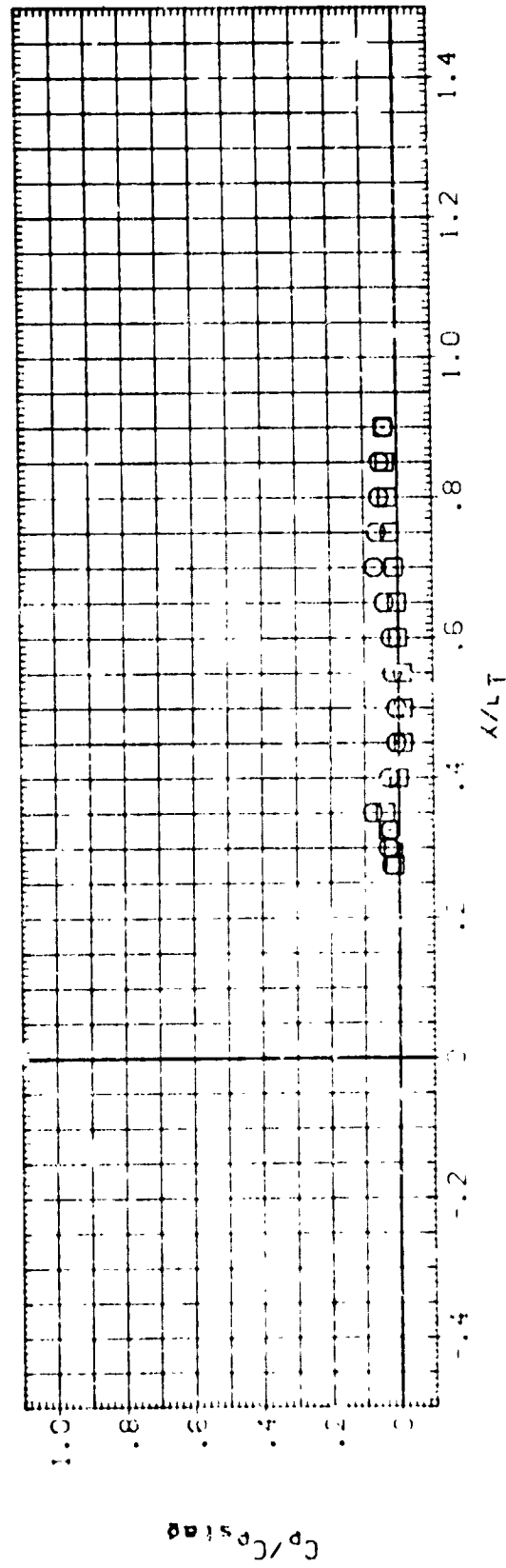
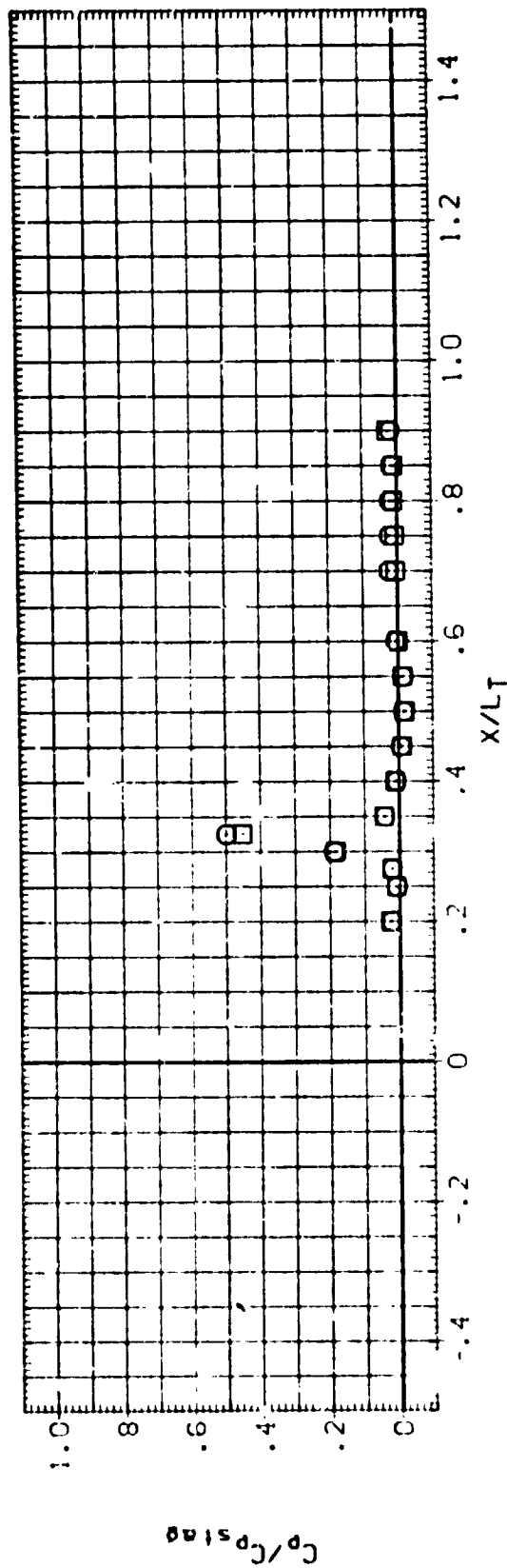


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0 PAGE 25

(RQ3TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 0 -5.000 135.000 4.600
 0 .000 123.000

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

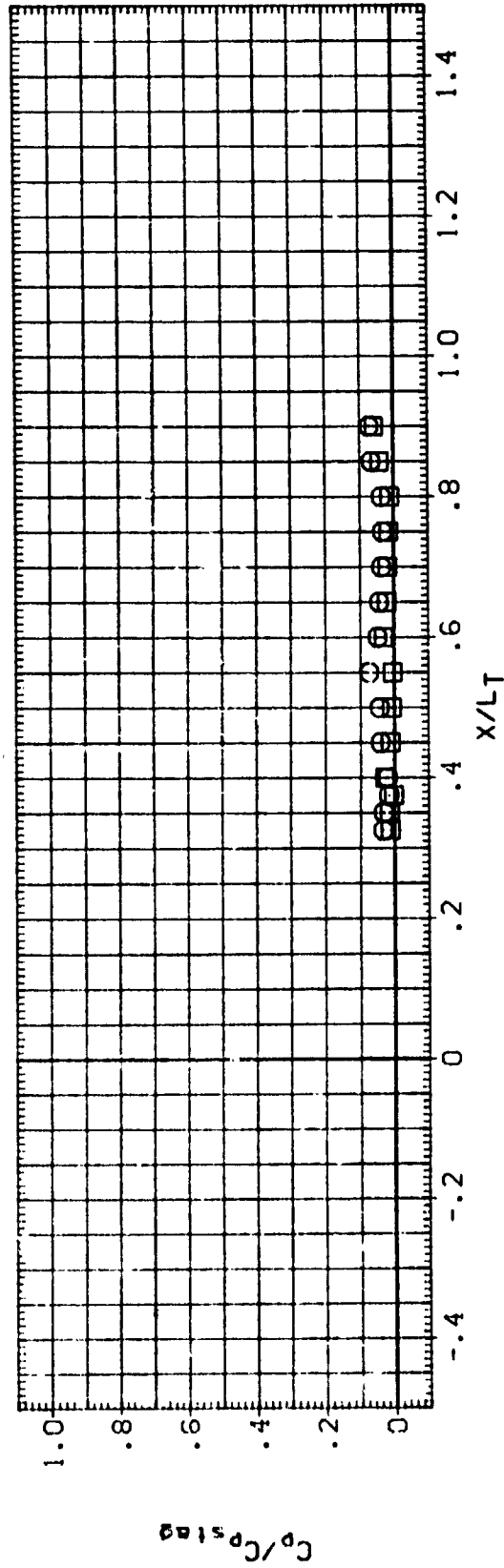
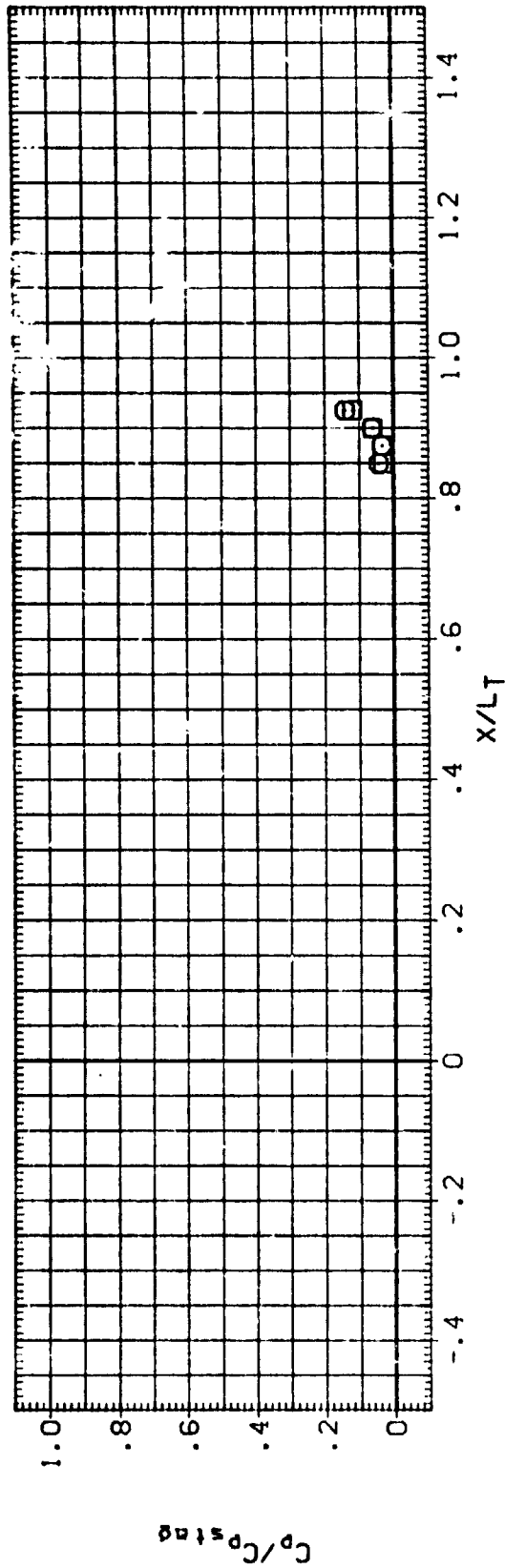


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L=3.0

(RQ3TAD) UPWT 1059 (IH4) 01-T15-S6N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 □ -5.000 180.000 4.600
 .000 157.500

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

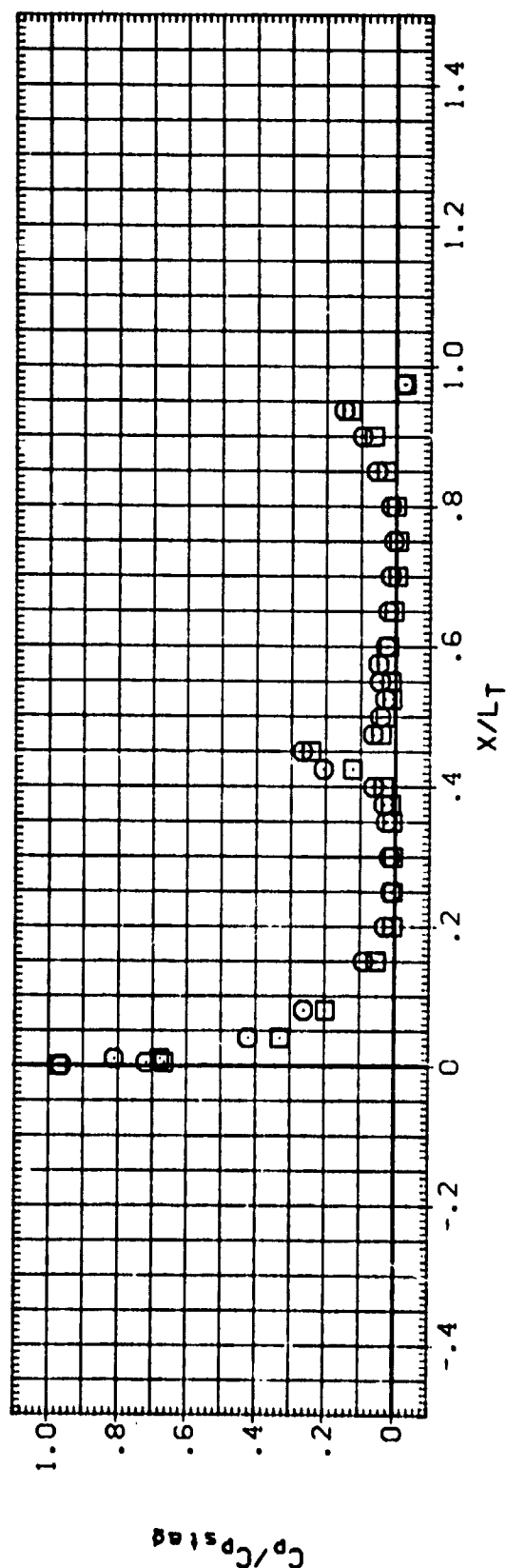
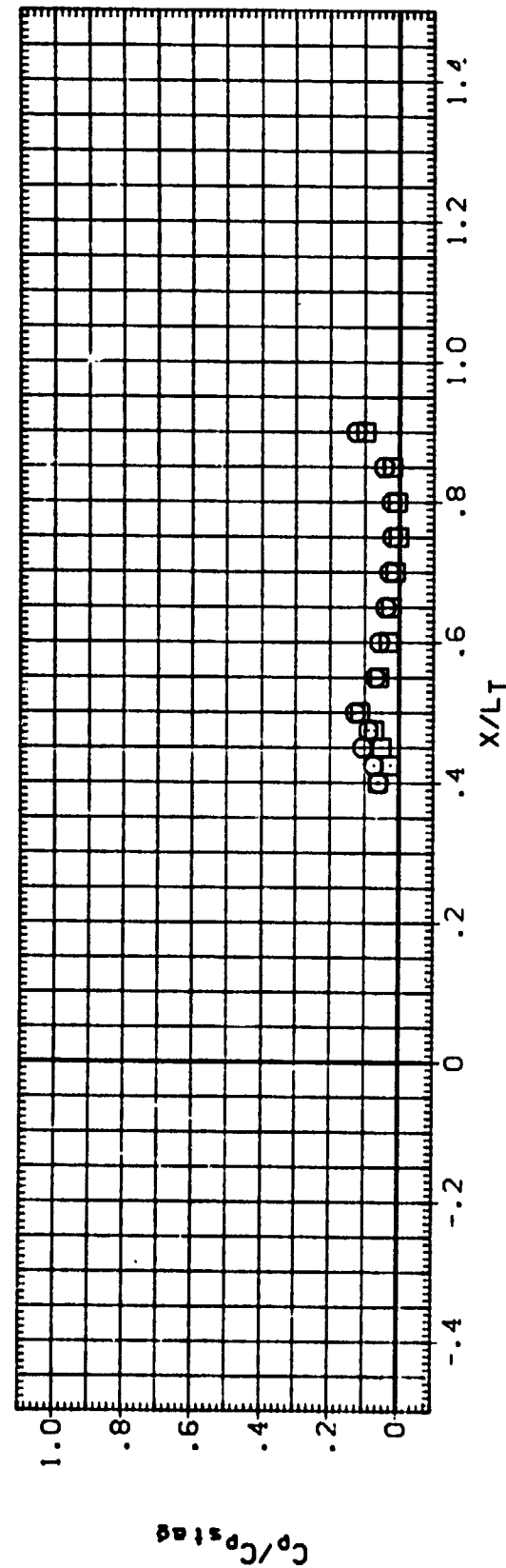


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, BETA=5. RN/L= 3.0

SYMBOL ALPHA THETA MACH
-5.000 210.000 4.600
0 197.000

PARAMETRIC VALUES
3.000 BETA
-5.000

RN/L

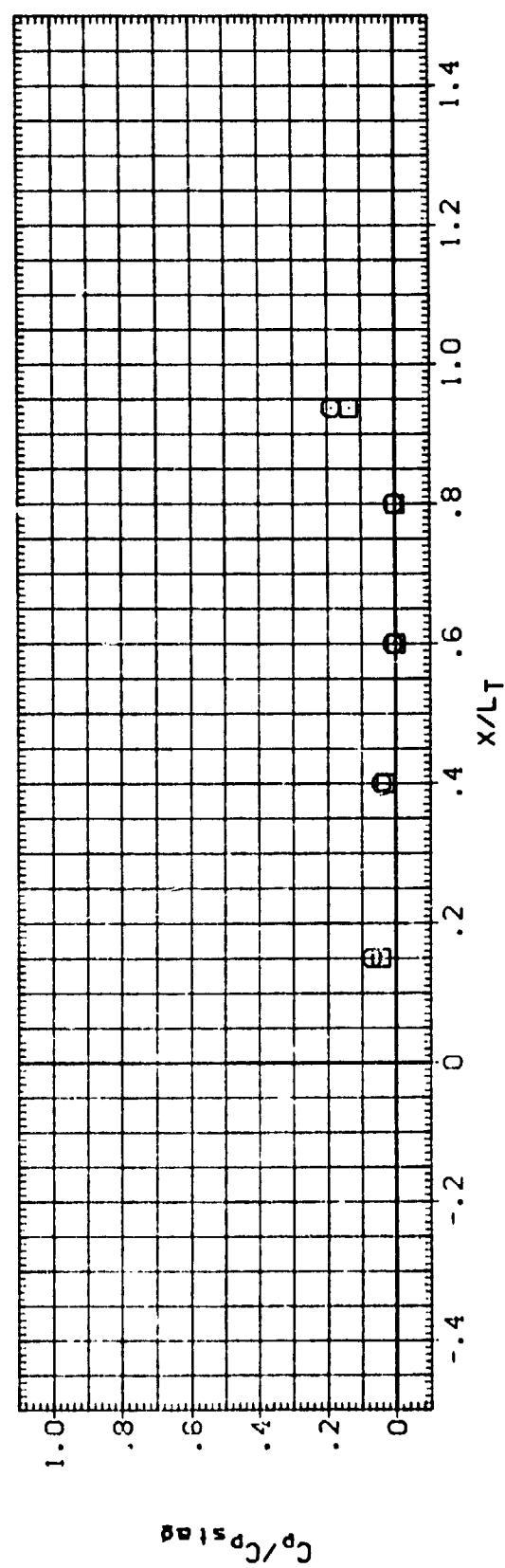
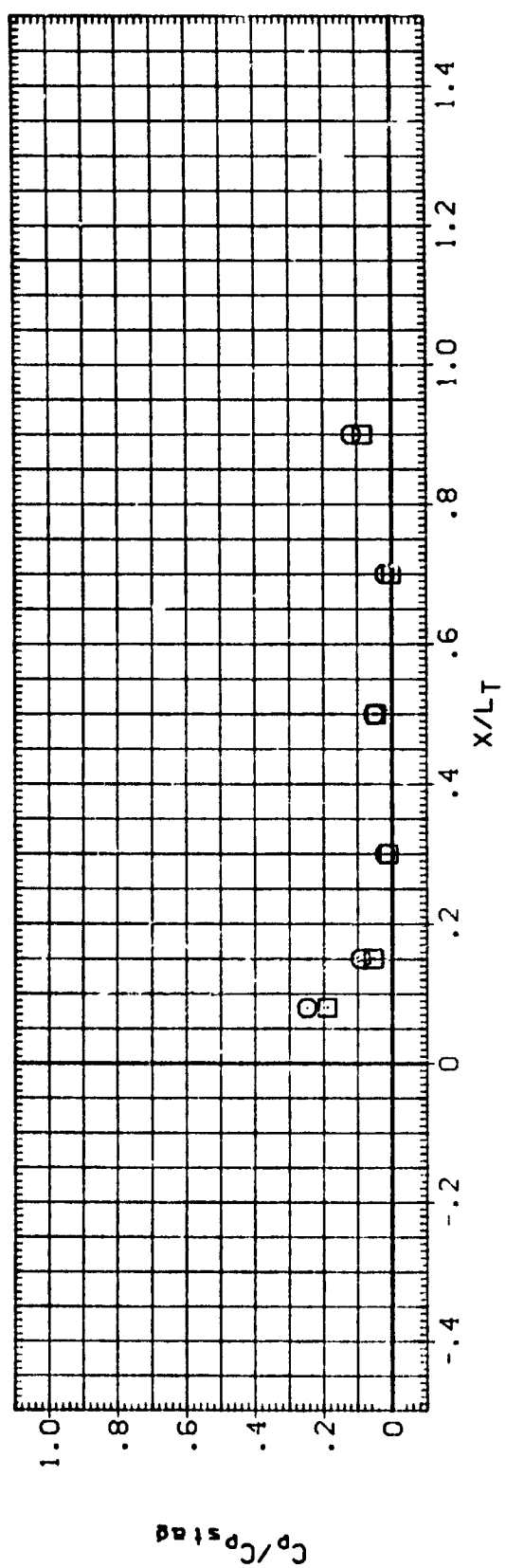


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

(RQ3TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA -5.000

RN/L

MACH 3.700

X/LT .350 .300

ALPHA -5.000

SYMBOL

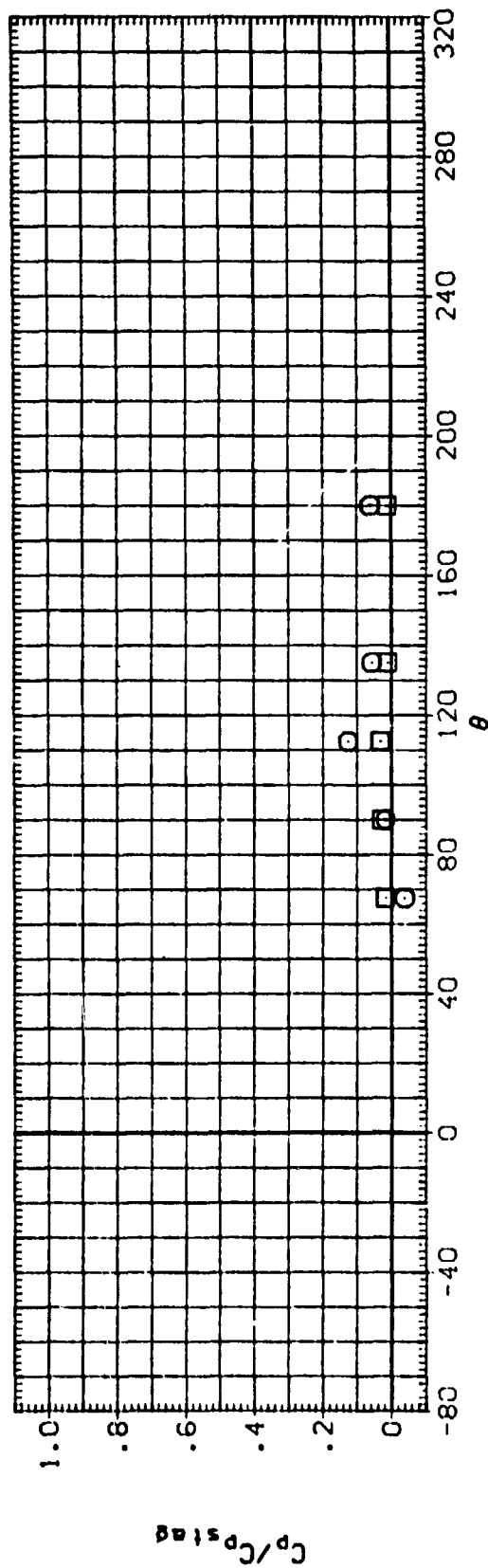
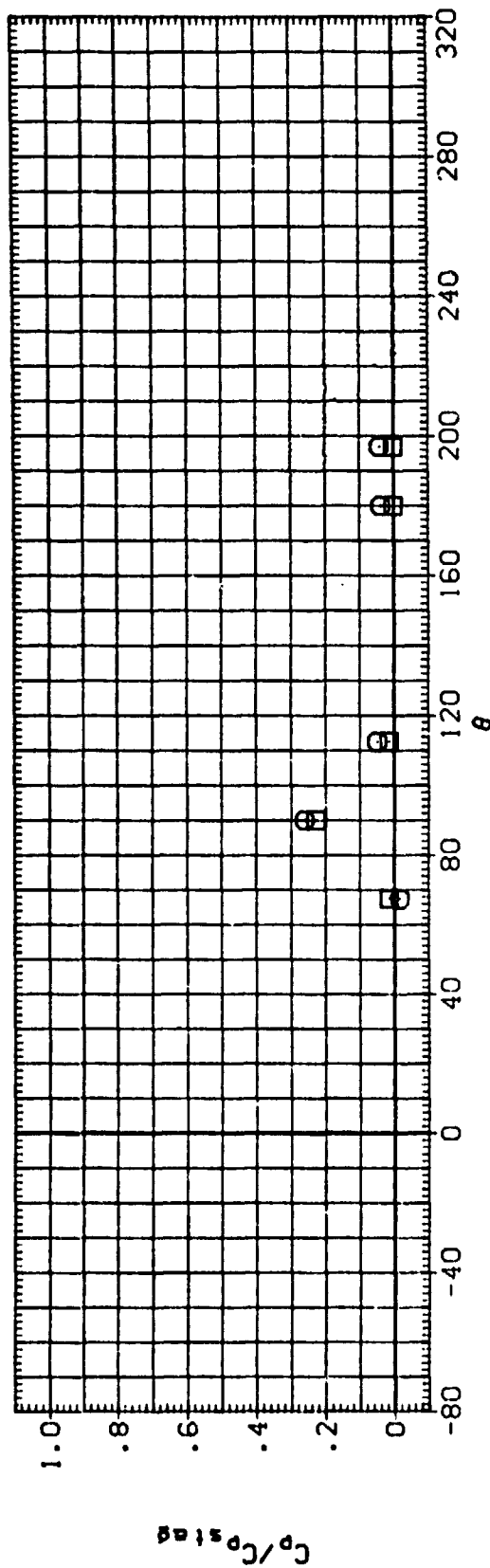


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

SYMBOL ALPHA
-5.000 .000

X/LT MACH
.500 3.700

PARAMETRIC VALUES
RN/L BETA
3.000 -5.000

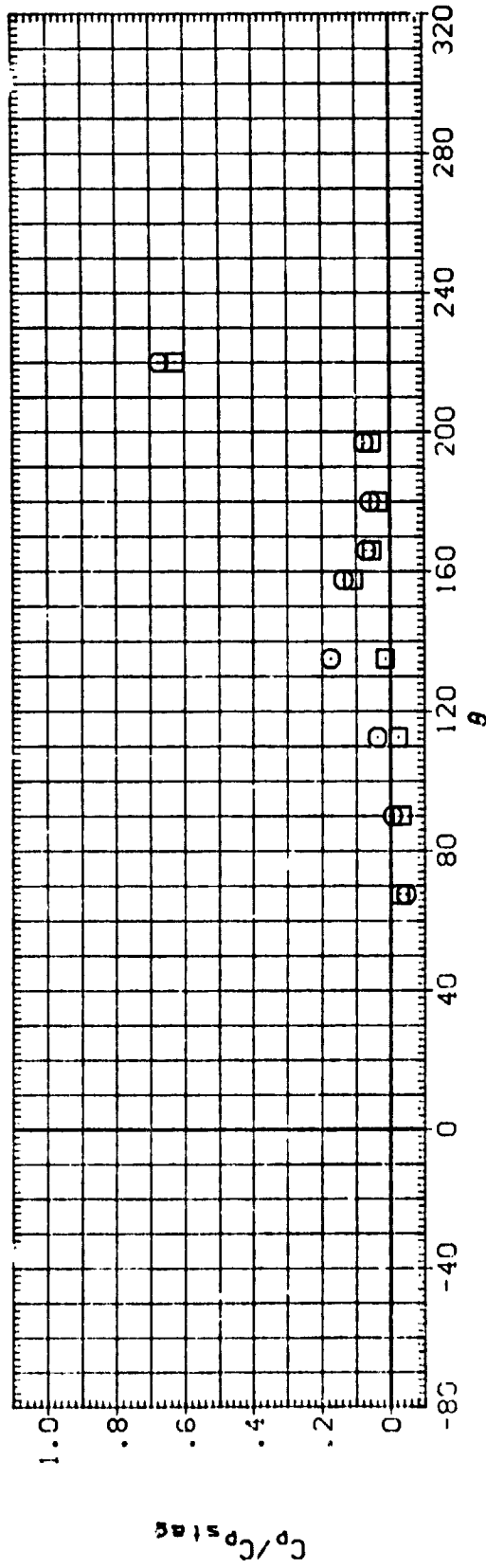
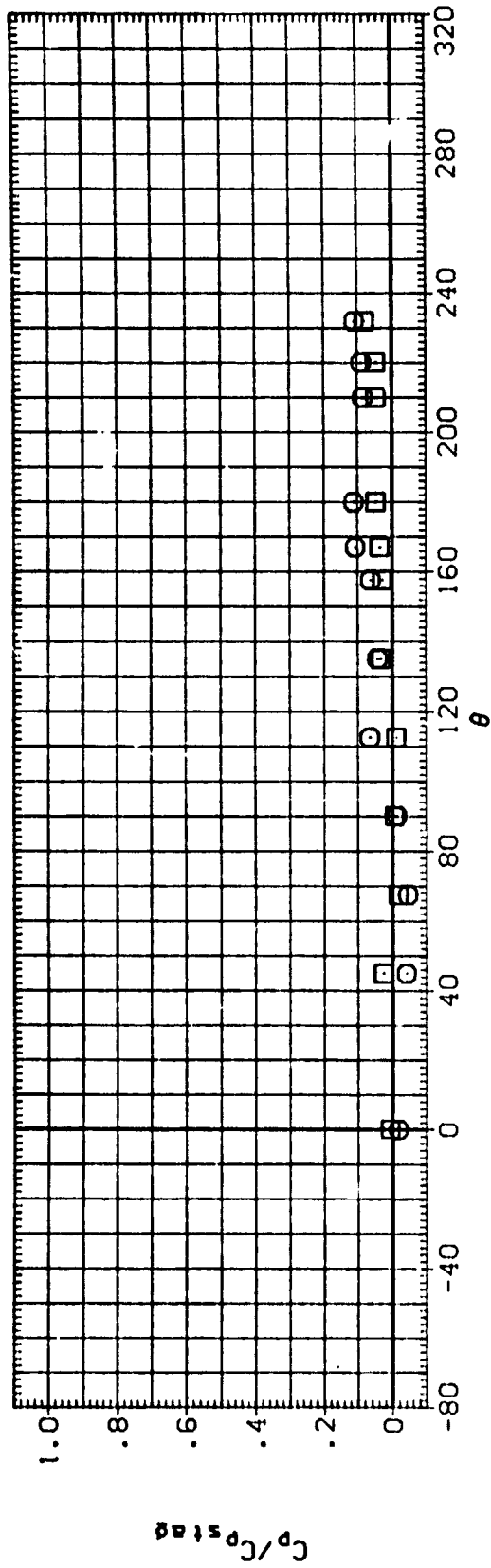


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(RQ3TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.600	3.700		3.000 BETA
	.000	.550			-5.000

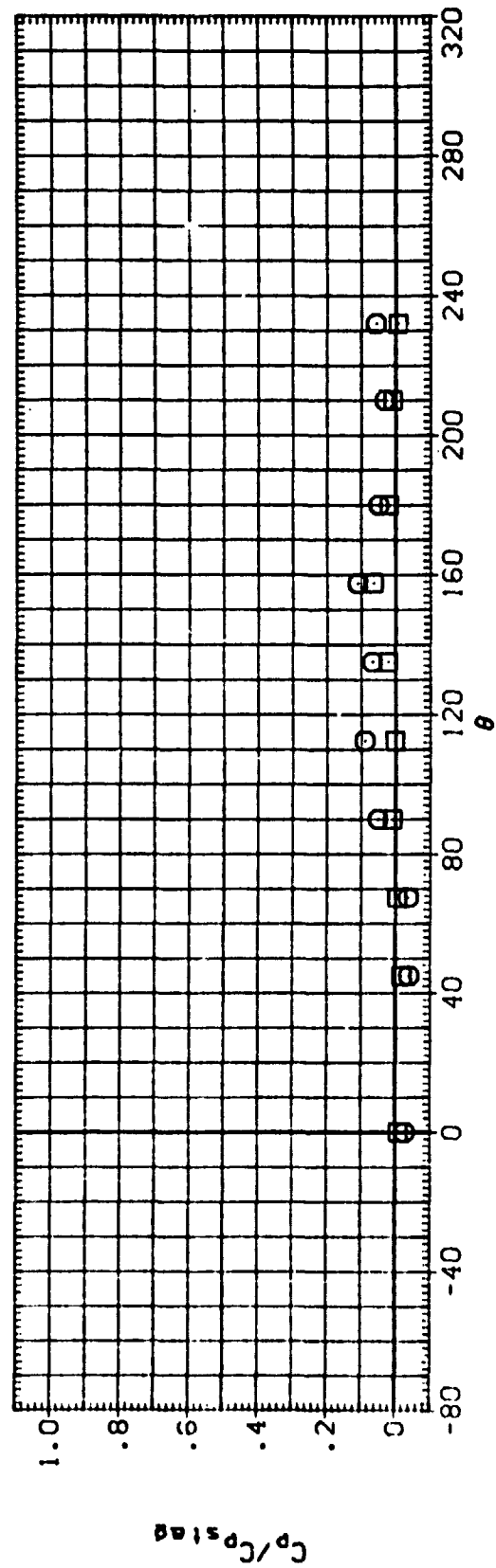
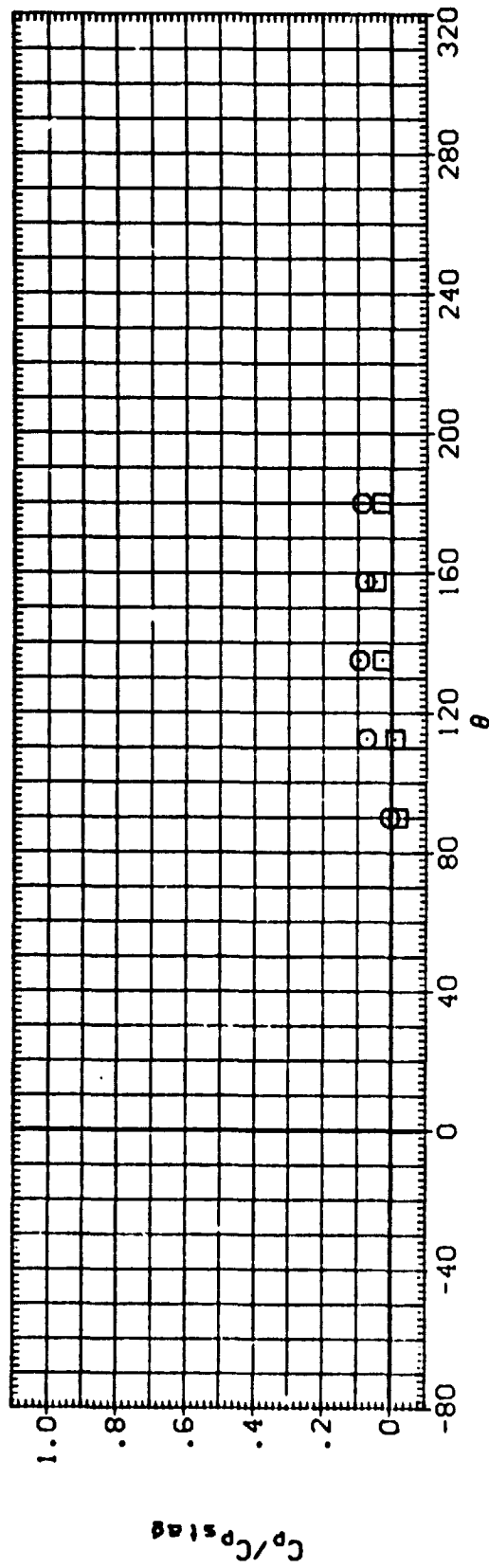


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

[RQ3TAD] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
 3.000 BETA -5.000

RN/L

MACH 3.700

X/LT .700 .650

ALPHA -5.000

SYMBOL

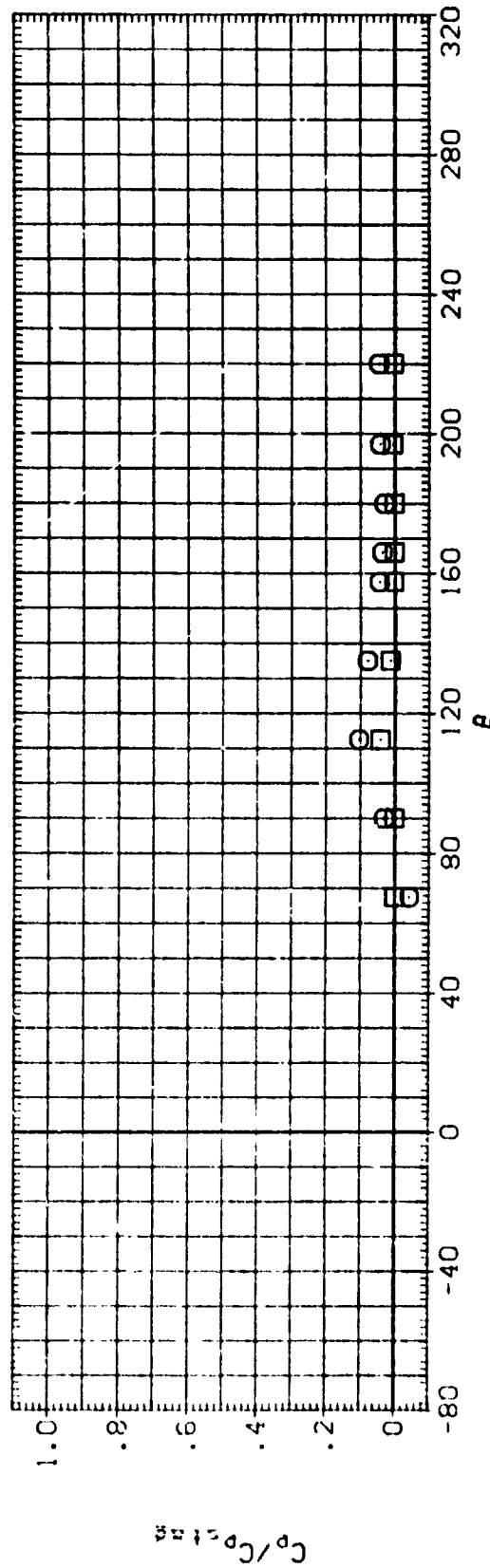
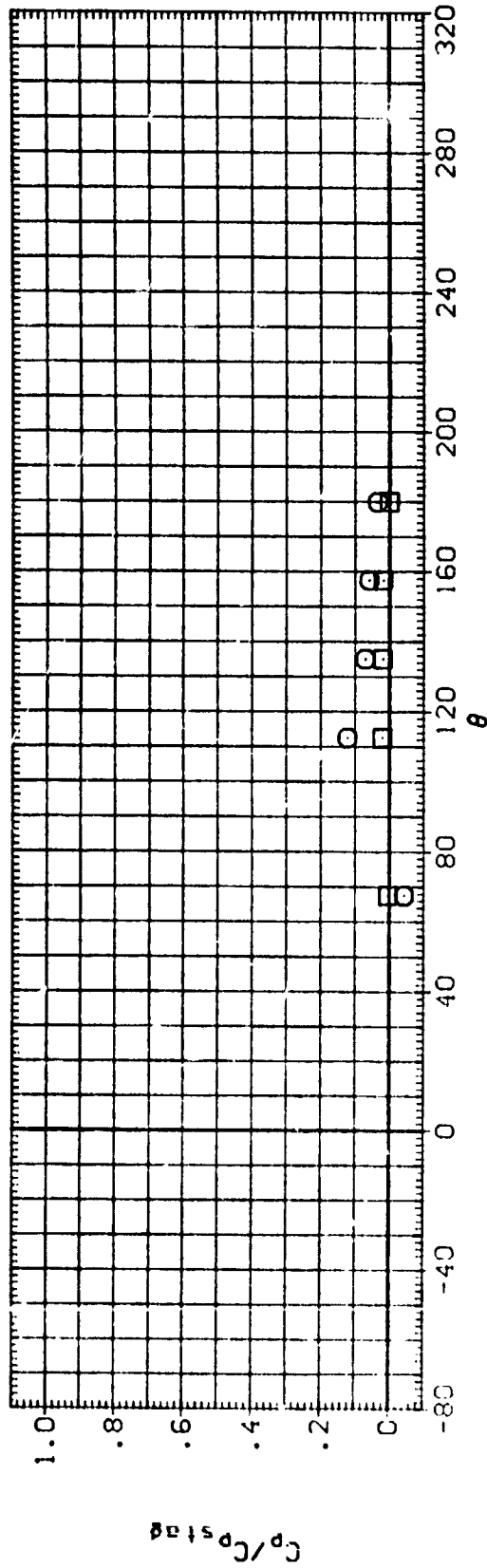


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK. BETA=-5. RN/L= 3.0

(R03TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.800	3.700		3.000 BETA
	.000	.750			-5.000

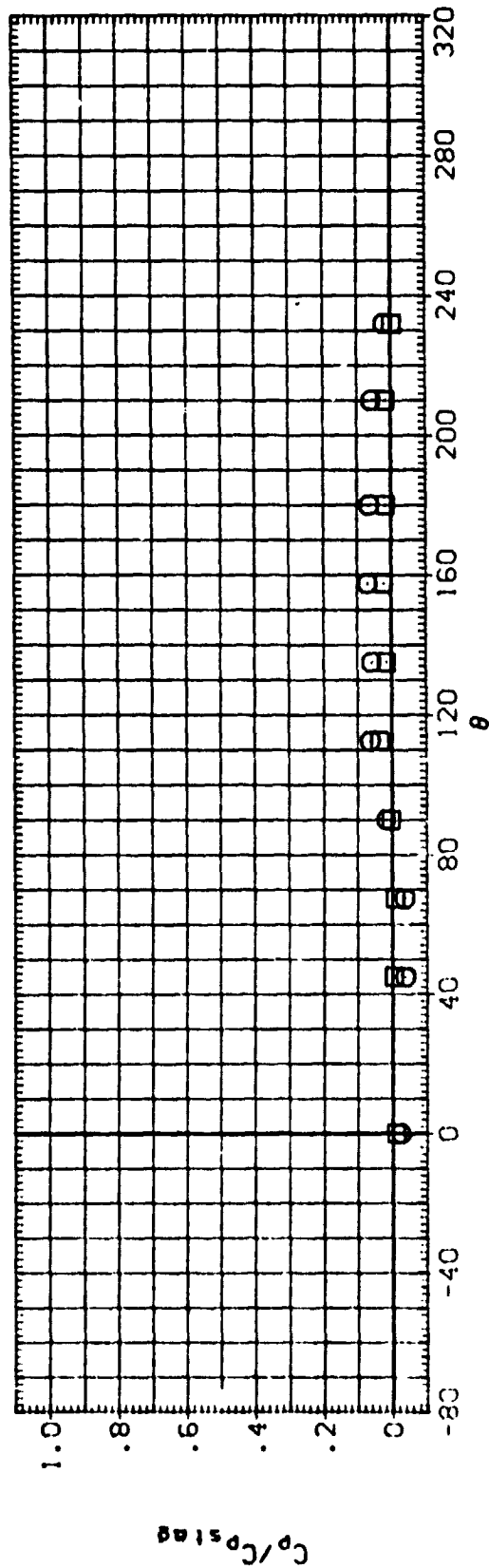
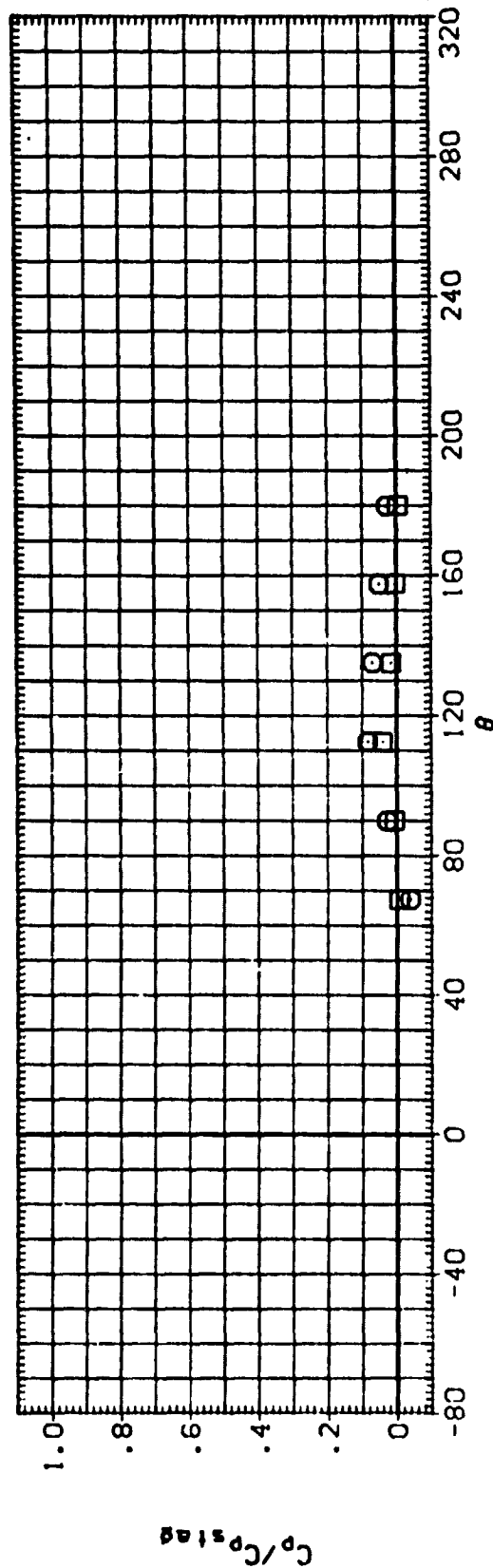


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

SYMBOL ALPHA X/LT MACH
 □ -5.000 .900 3.700

PARAMETRIC VALUES
 3.000 BETA -5.000

RN/L

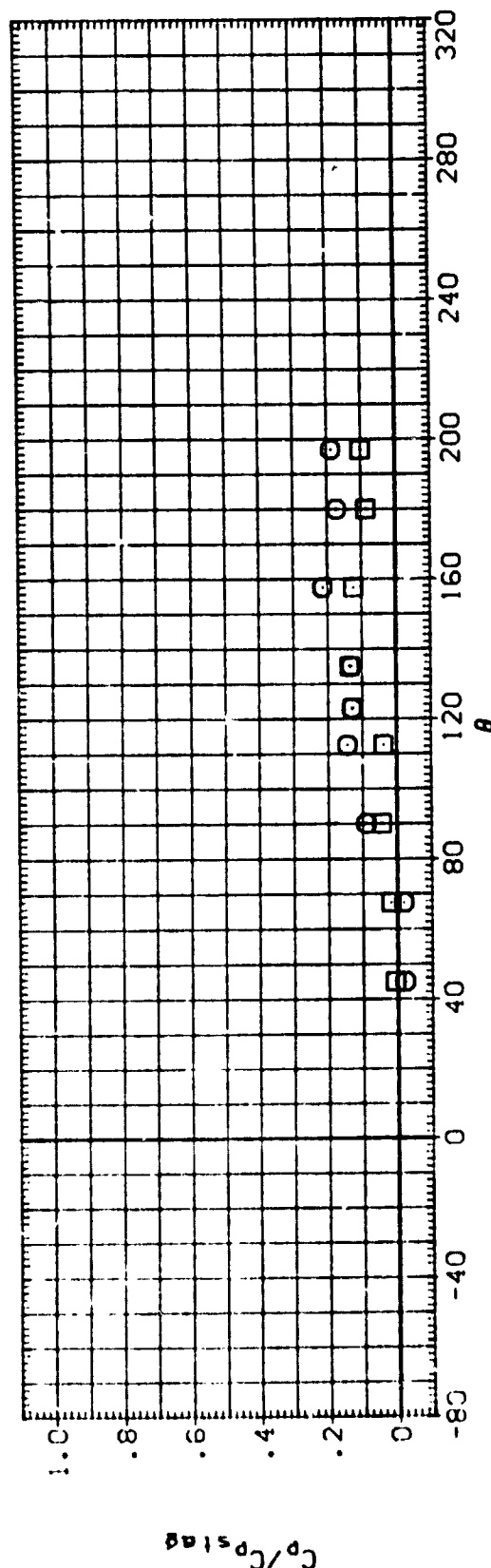
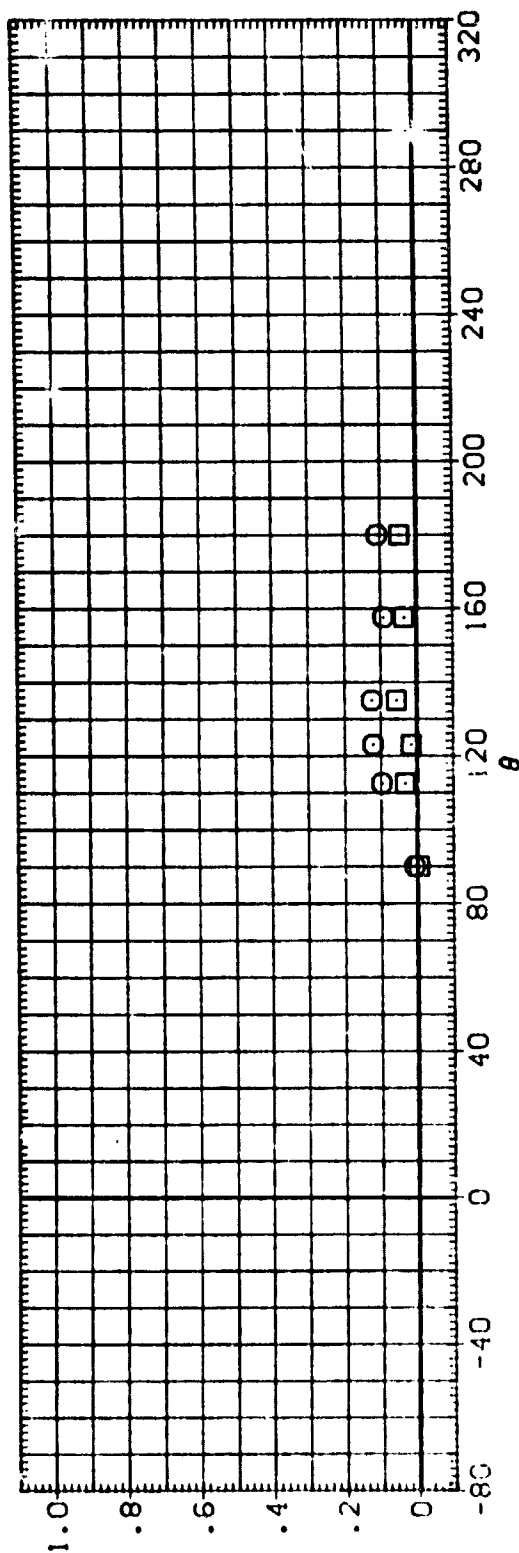


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

(R03TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
-5.000 .350 4.600

RN/L

3.000

BETA

-5.000

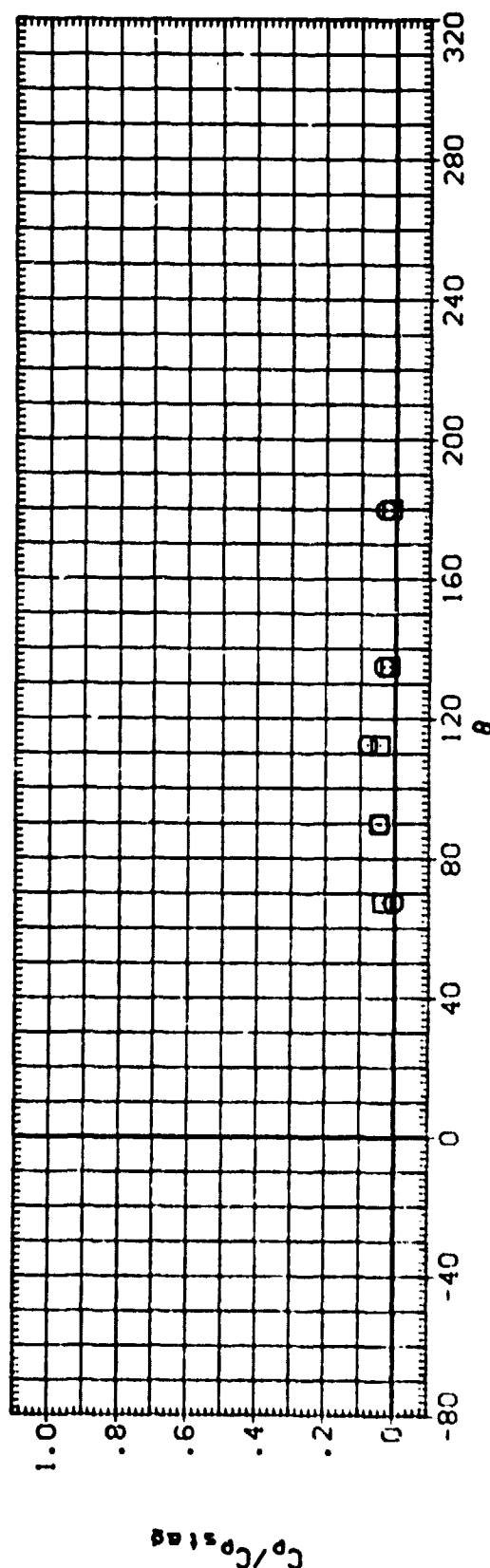
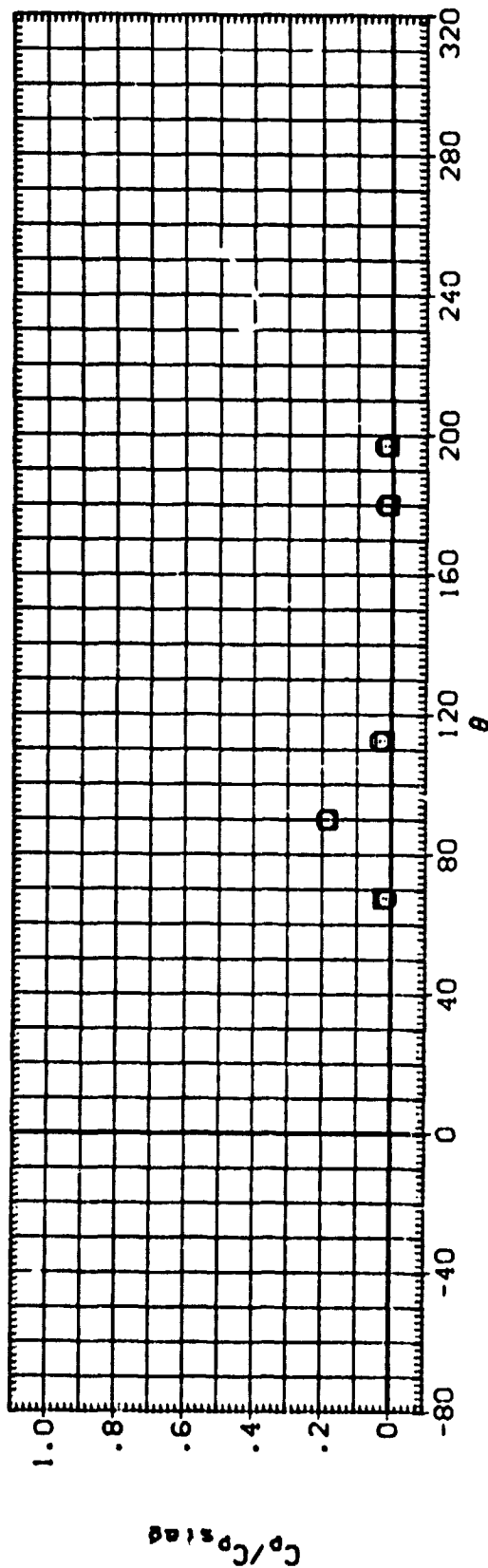


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

[RQ3TAD] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -5.000 .500 4.600
 .000 .400

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

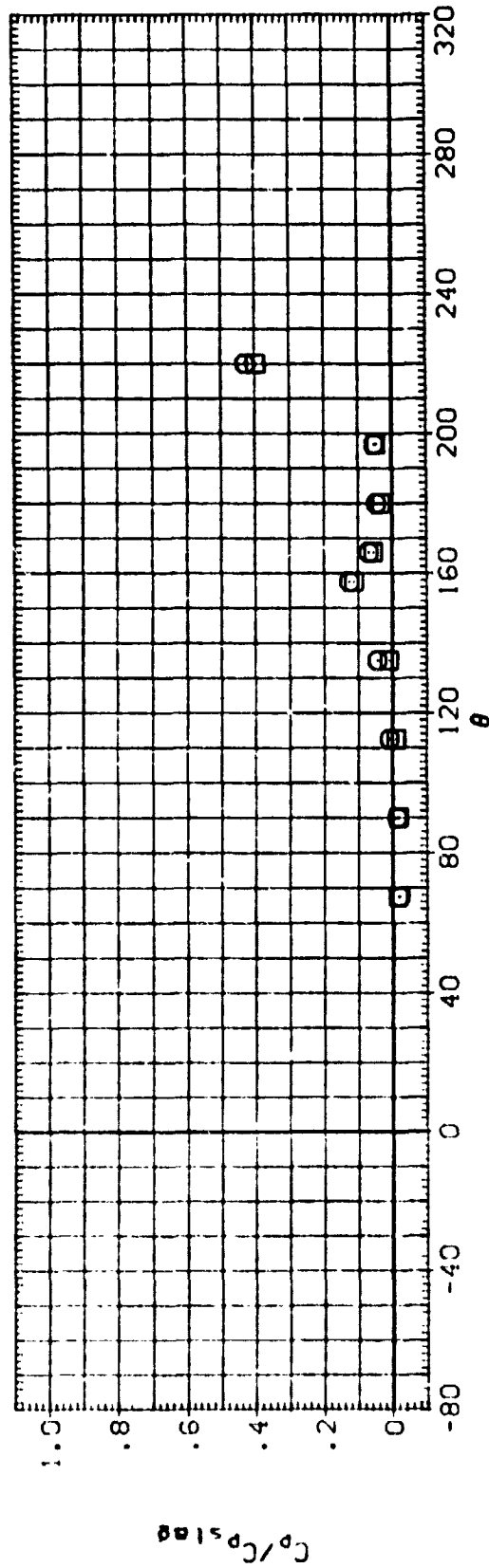
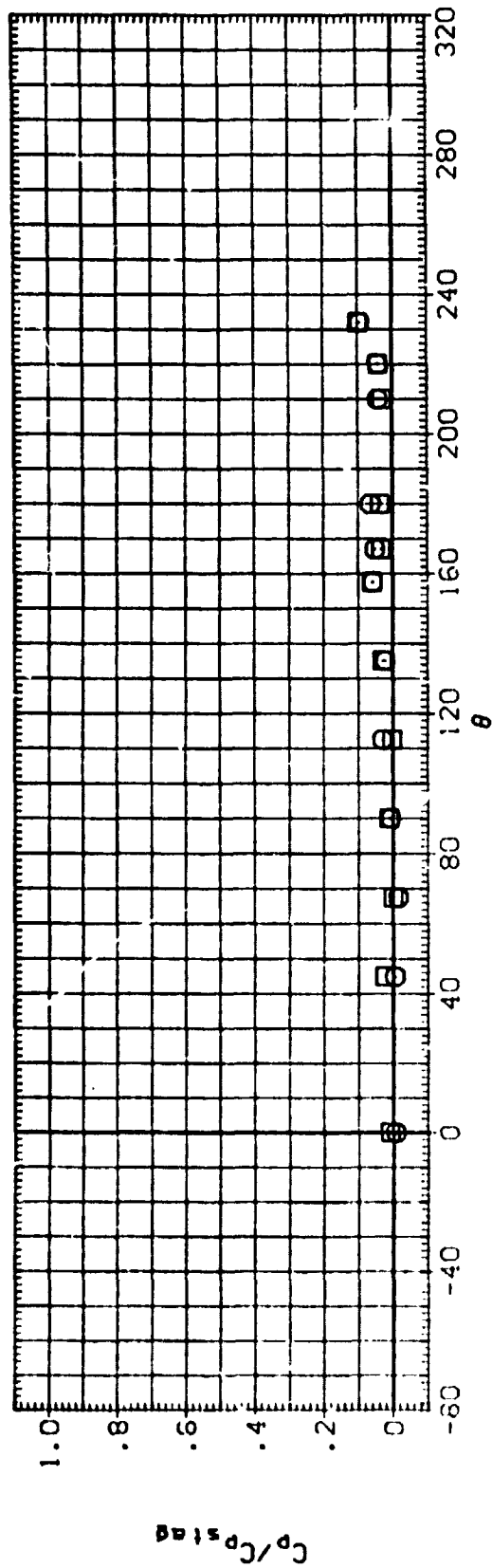


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK. BETA=-5. RN/L= 3.0

(R03TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	PARAMETRIC VALUES
□	-5.000	.600	4.600	3.000 BETA
	.000	.550		-5.000

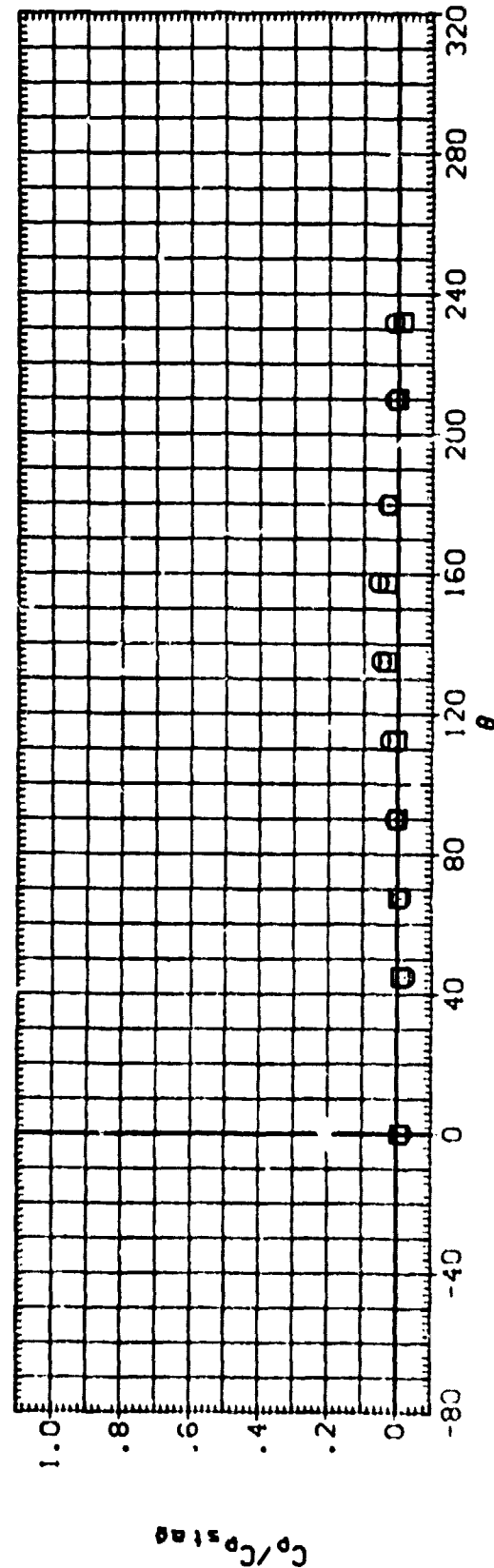
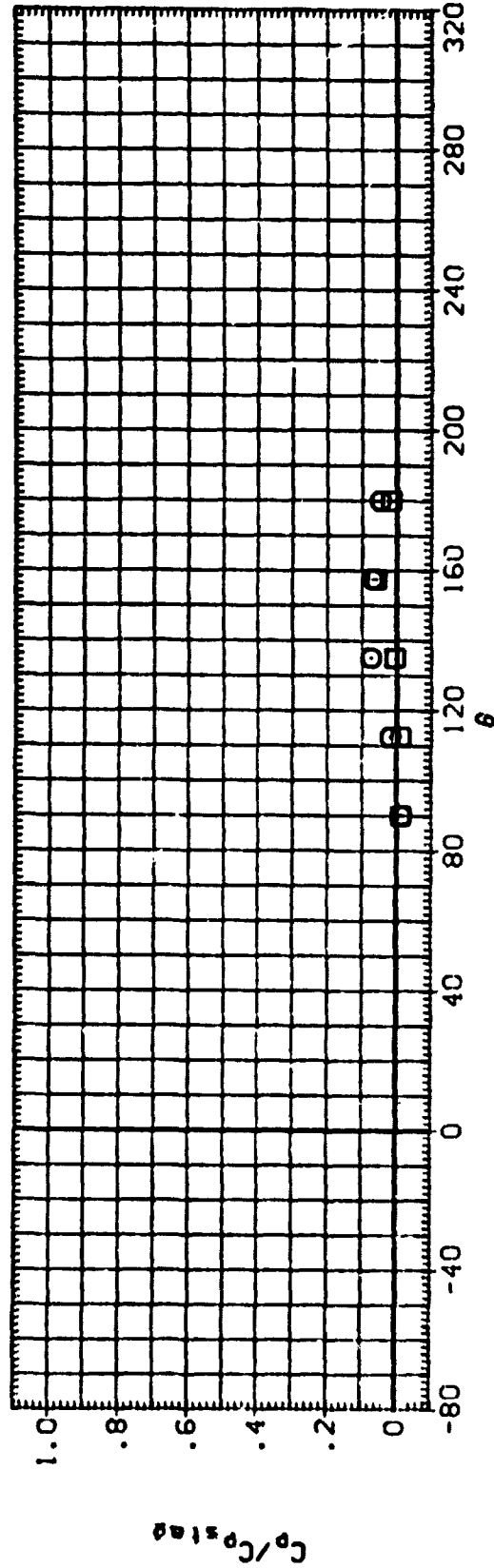


FIG. 8 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

(R03TAD) UPWT 1059 (IH4) 01-T15-S8Ni6 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA -5.000

RN/L

SYMBOL ALPHA X/L² MACH
8 -5.000 .700 4.600
.000 .650

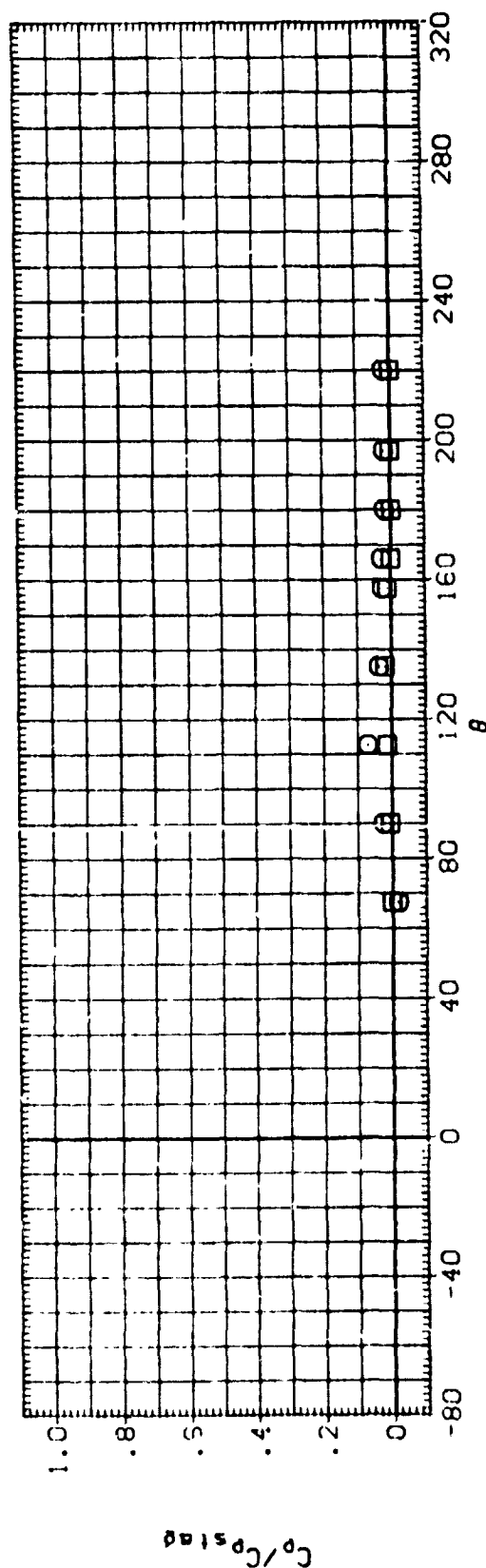
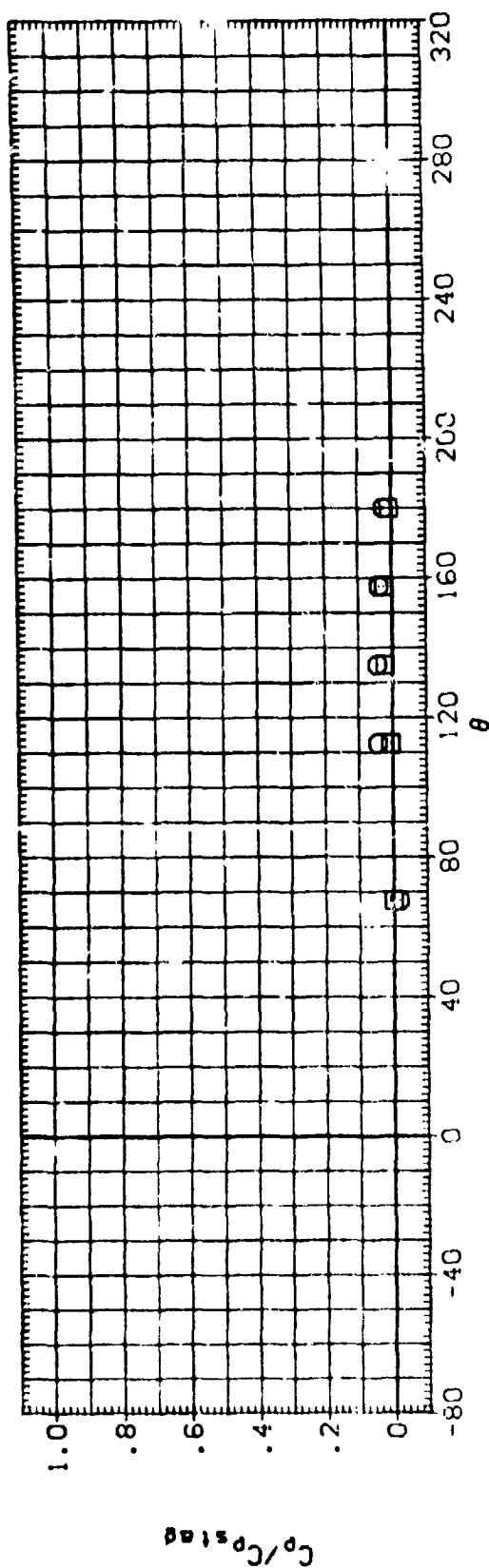


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA=-5. RN/L= 3.0

(R03TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ -5.000 .800 4.600
 .000 .750

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

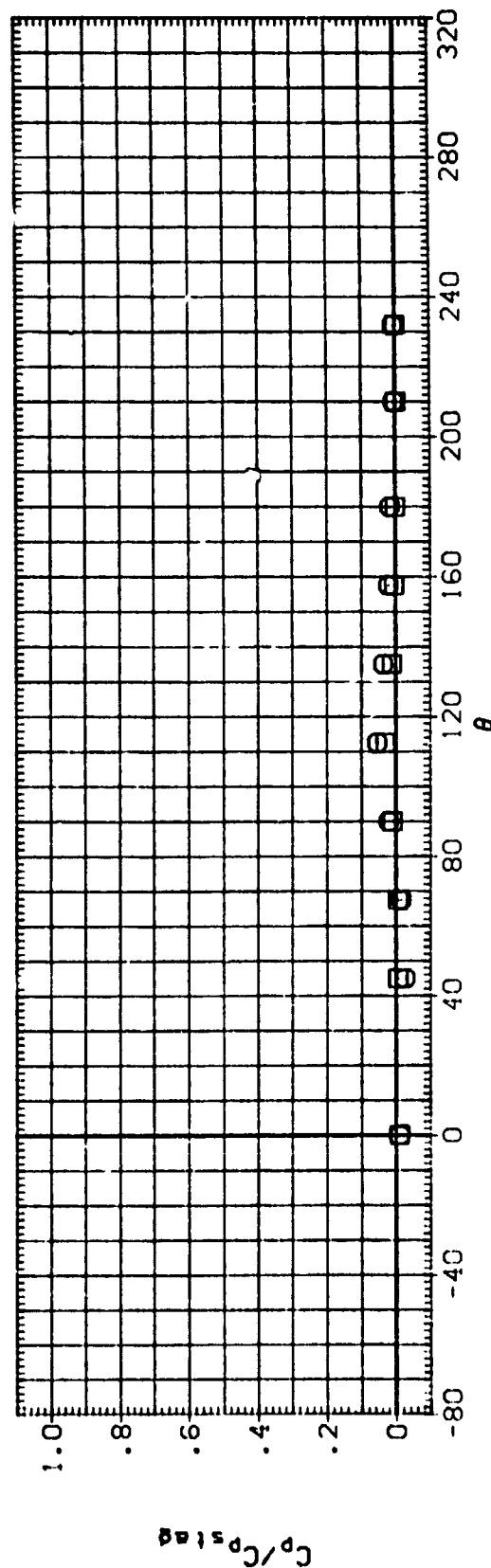
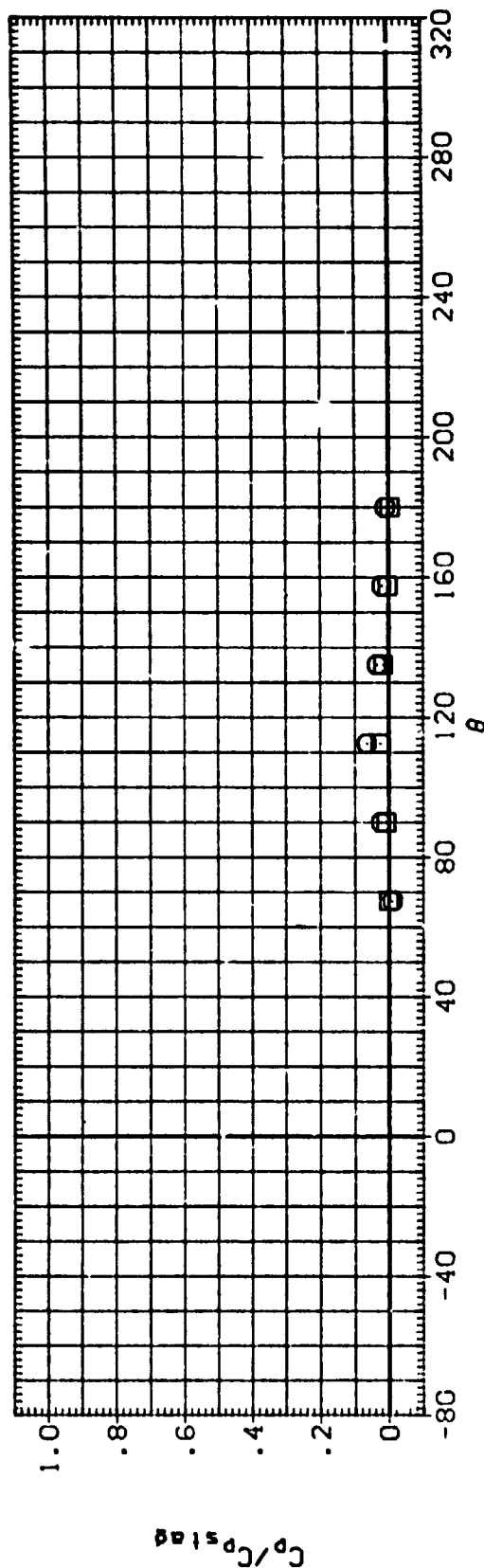


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, BETA=-5. RN/L= 3.0

(R03TAD) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA
-5.000
.000

K/LT
.900
.850

MACH
4.600

RN/L

PARAMETRIC VALUES
3.000 BETA

-5.000

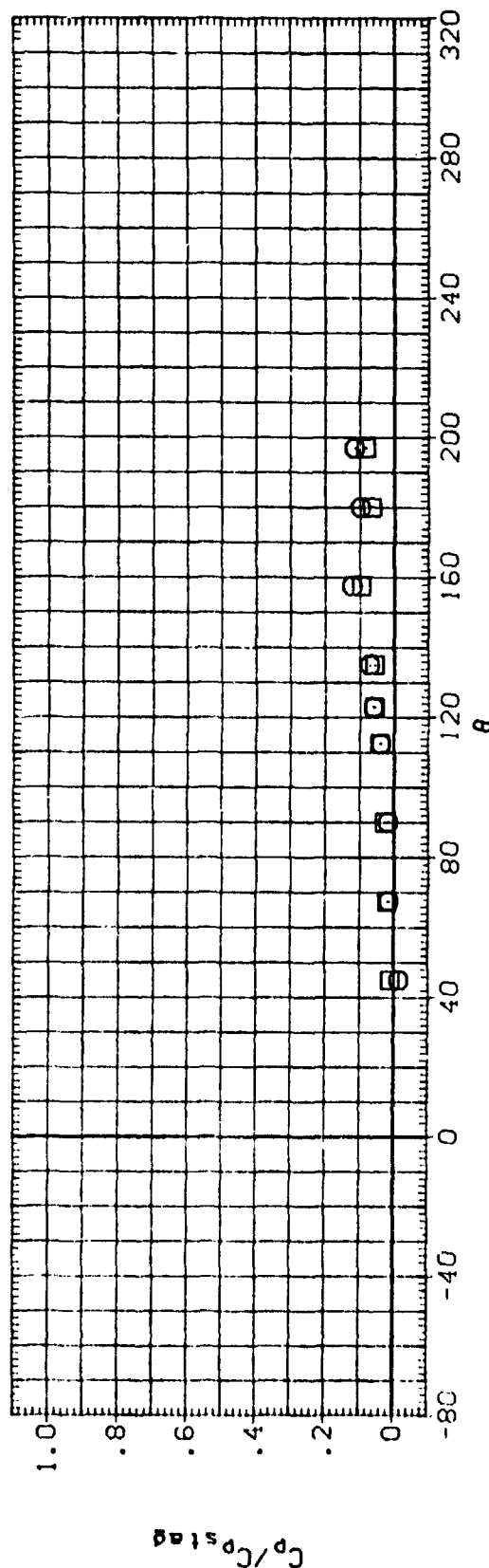
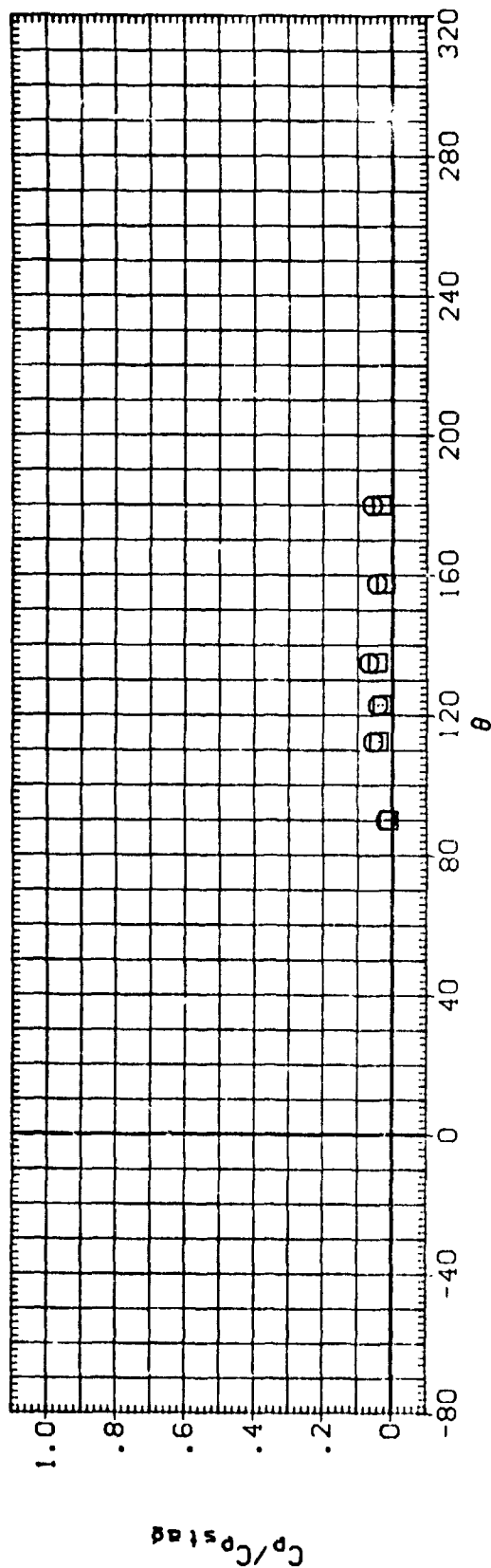


FIG. 8 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK. BETA=-5. RN/L= 3.0

(R03SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	PSI	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	180.000	3.700		3.000 BETA -5.000
□	.000	90.000			

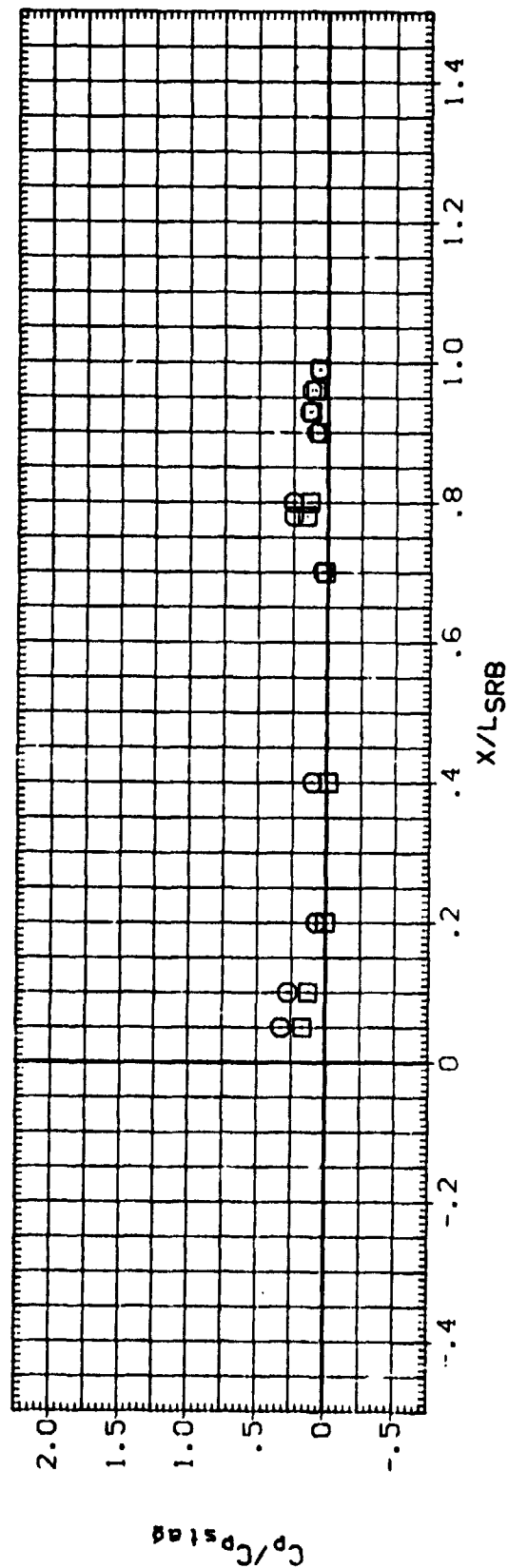
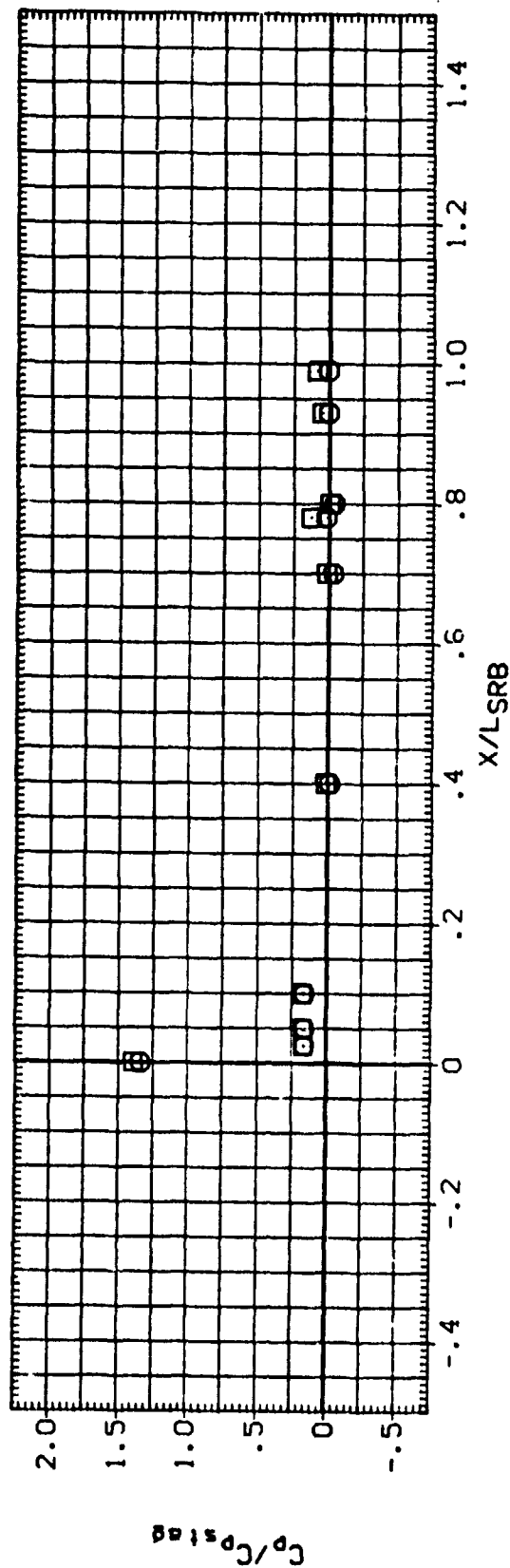


FIG. 9 VARIATION OF C_p/C_{psrb} ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(R03SAD) UPWT 1J59 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -5.000 225.000 3.700
 .000 210.000

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

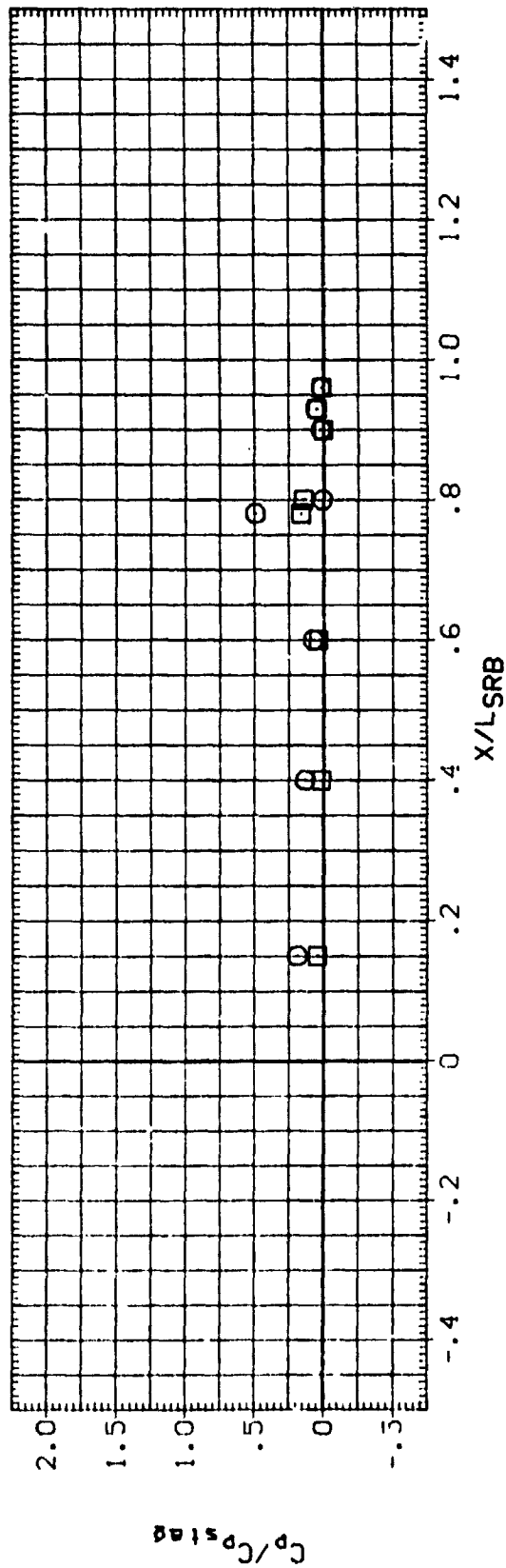
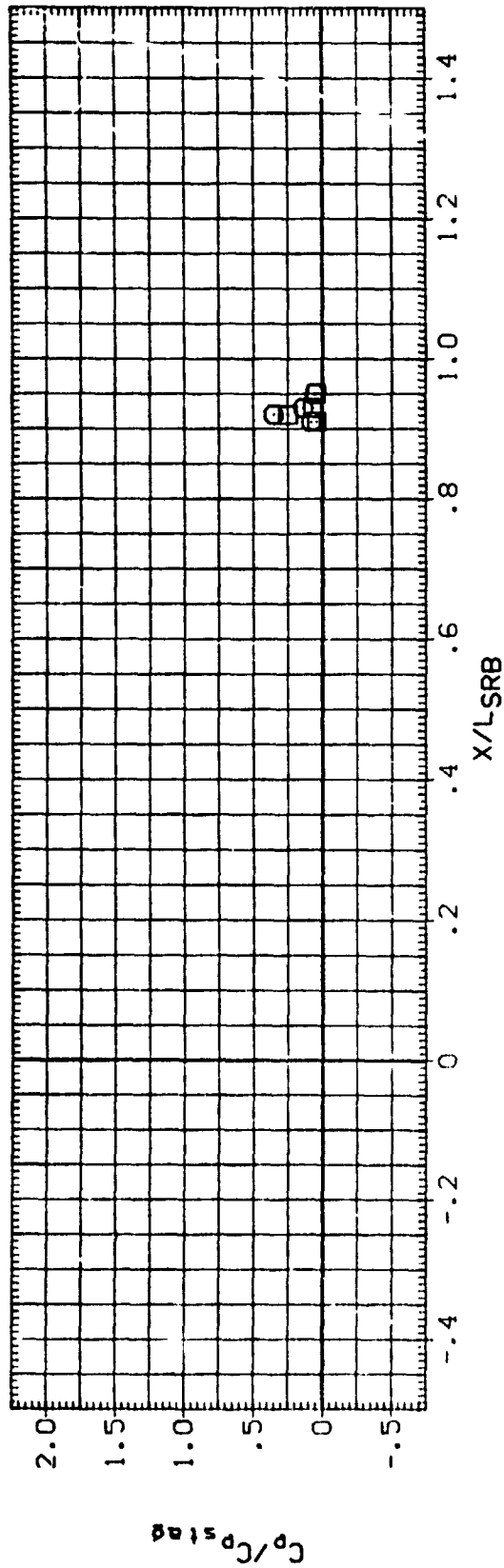


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, BETA=-5, RN/L= 3.0

(R03SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 □ -5.000 270.000 3.700
 ○ .000 247.500

PARAMETRIC VALUES
 3.000 BETA
 RN/L -5.000

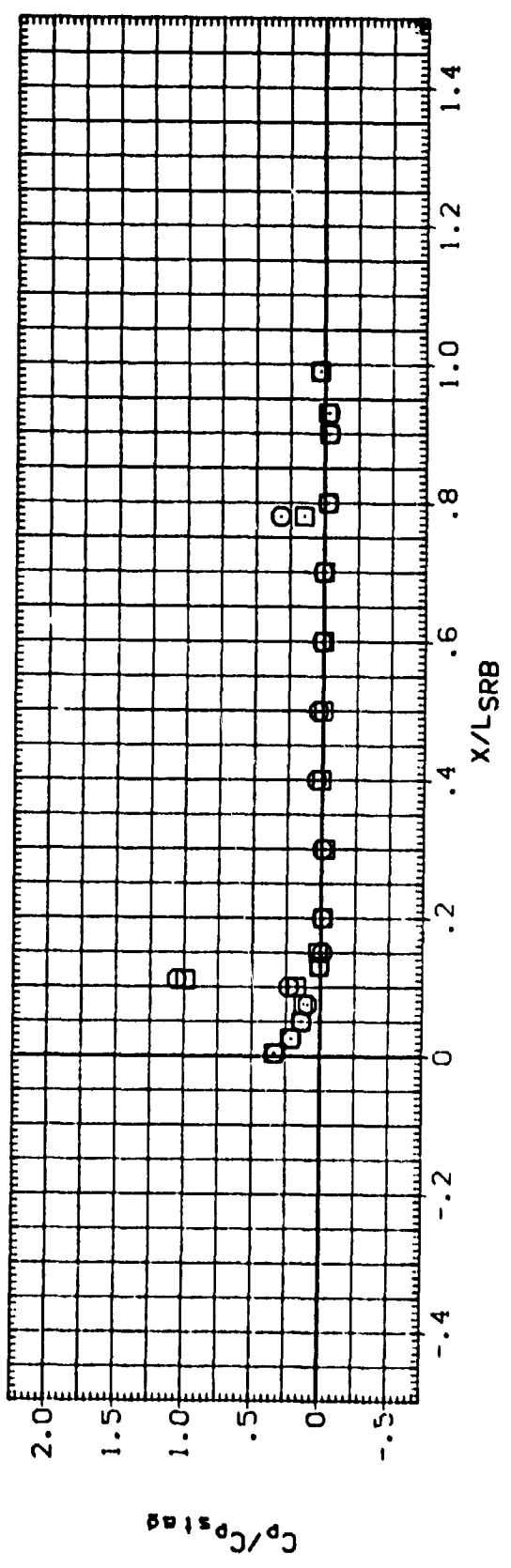
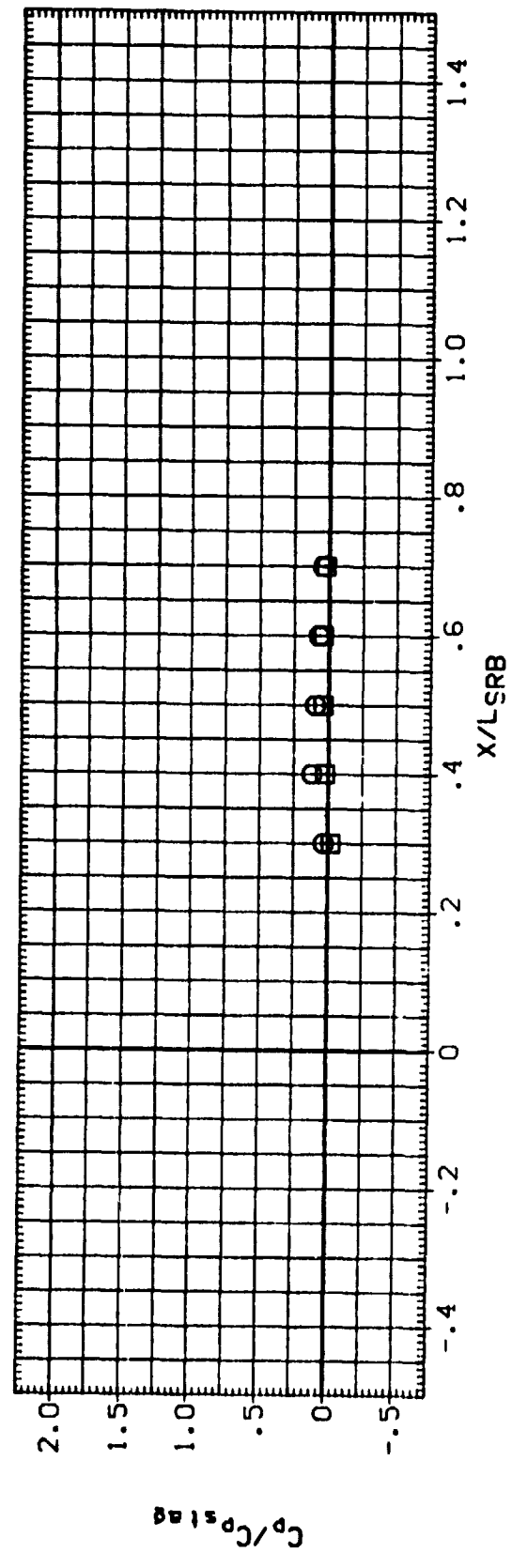


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(RQ3SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
-5.000 180.000 4.600
90.000

PARAMETRIC VALUES
RN/L BETA -5.000

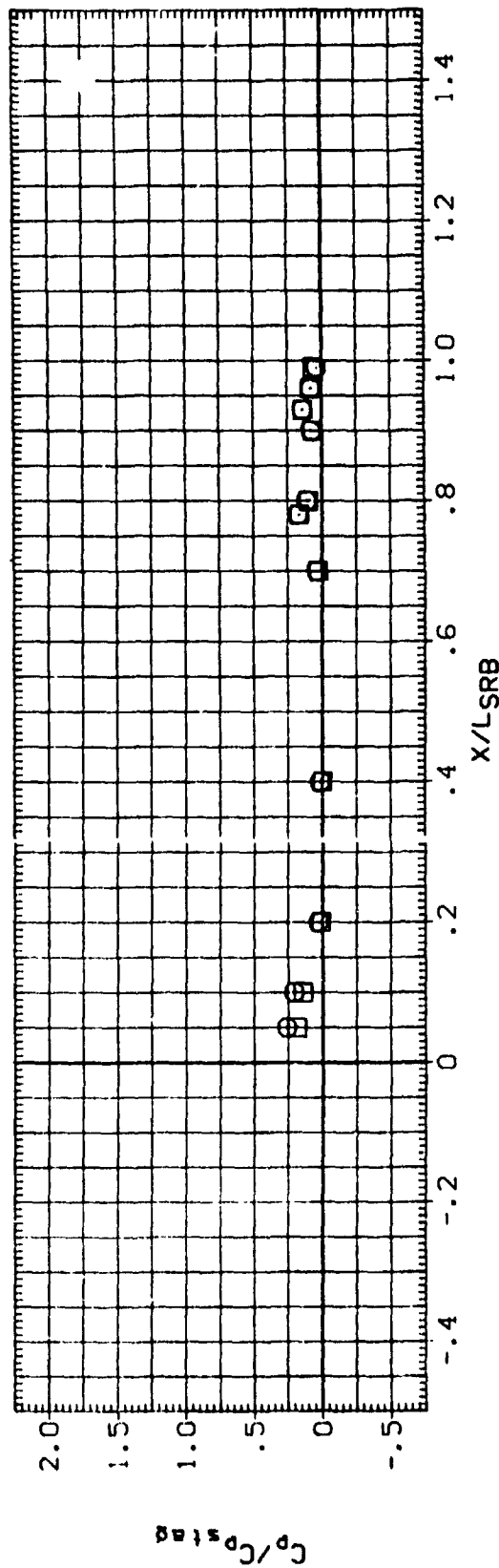
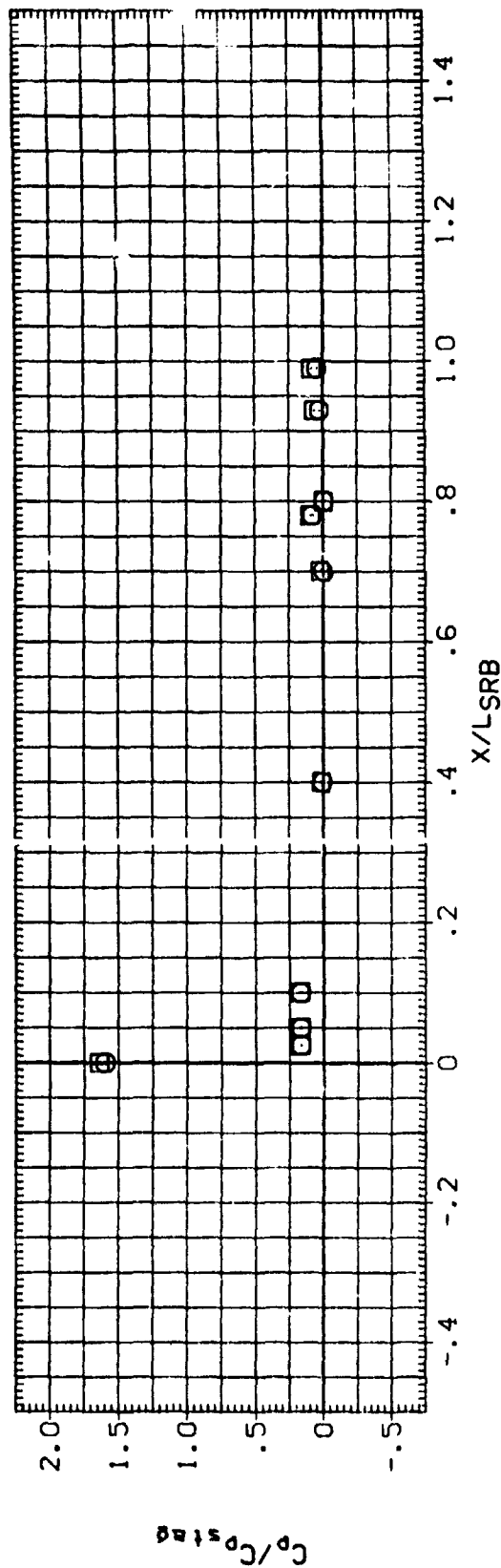


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(R03SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 □ -5.000 225.000 4.600
 .000 210.000

PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

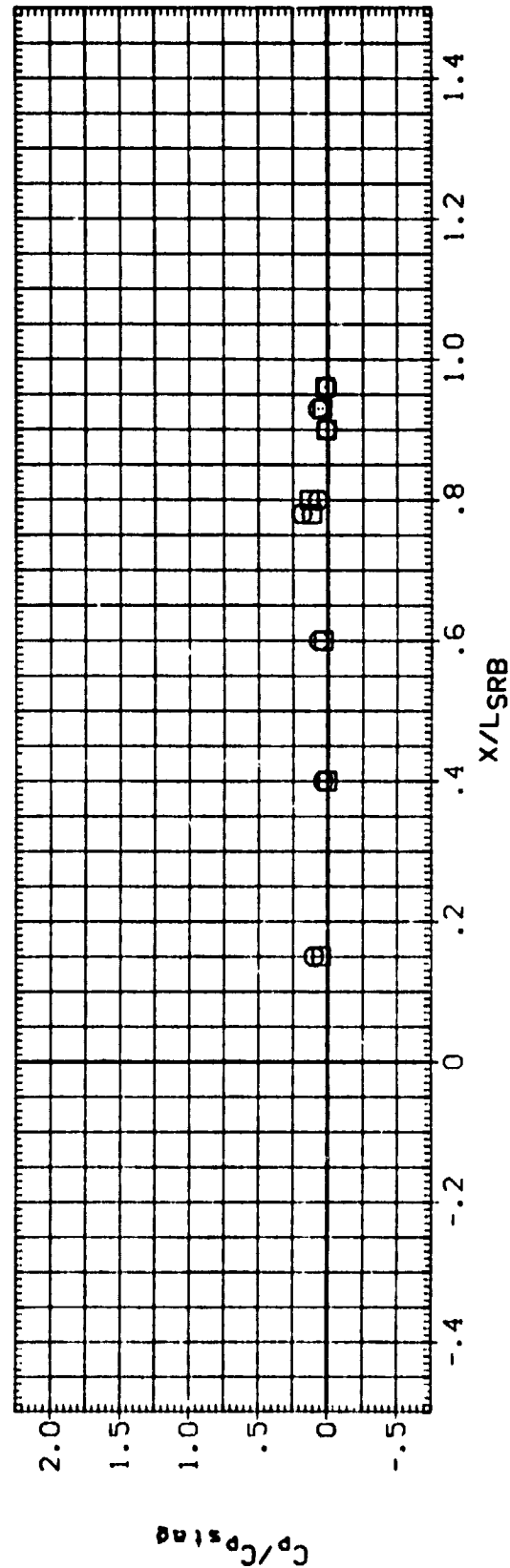
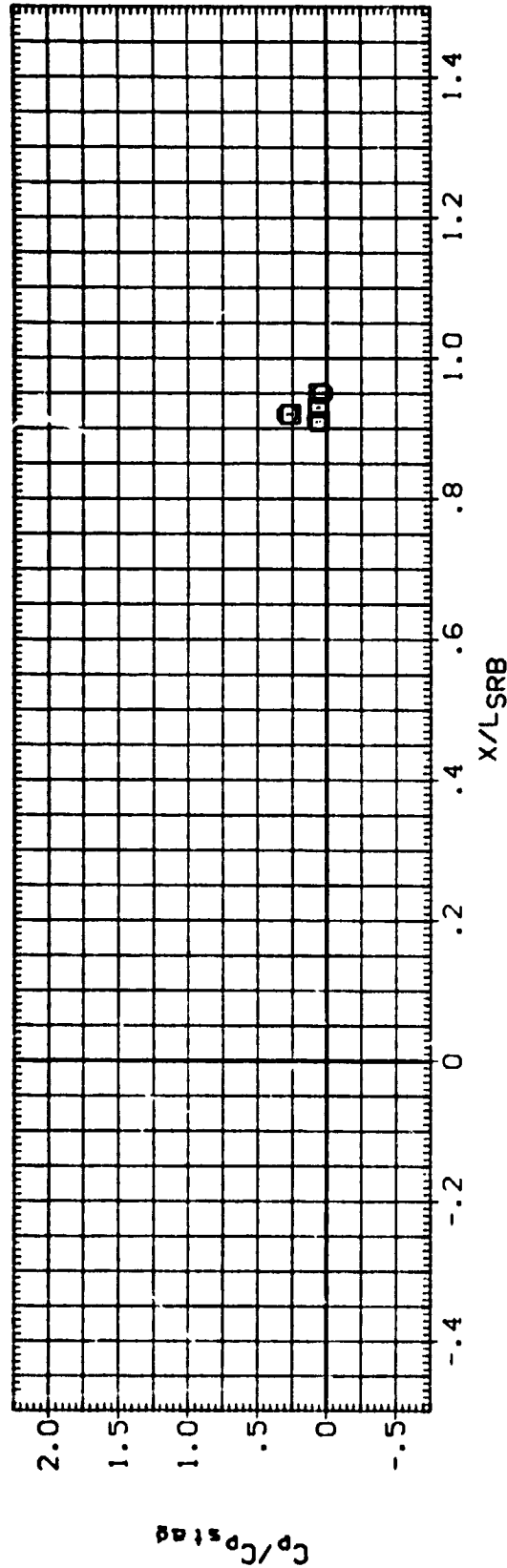


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(R03SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -5.000 270.000 4.600
 .000 247.500

PARAMETRIC VALUES
 3.000 BETA -5.000

RN/L

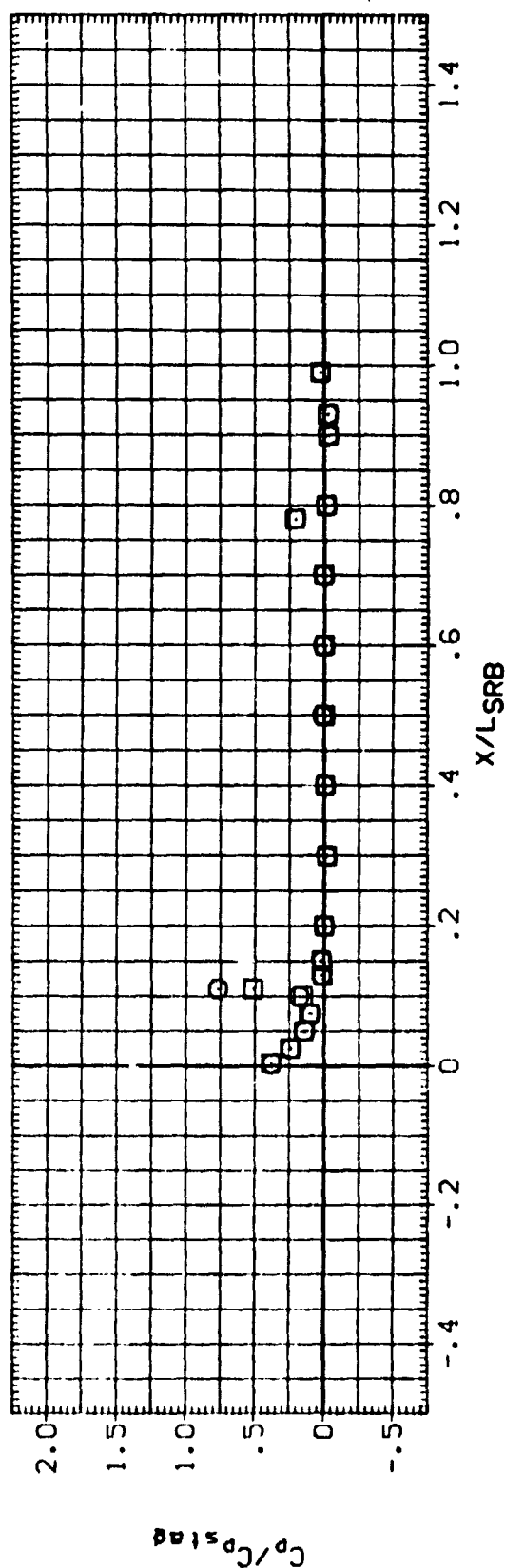
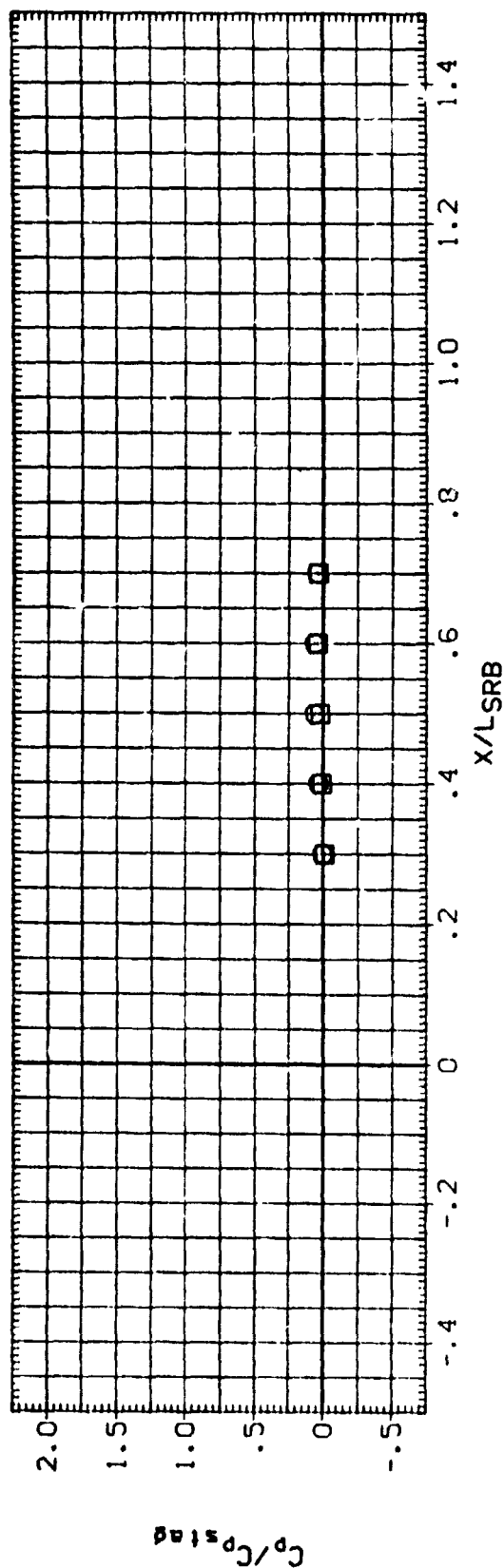


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(R03SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	X/LSRB	PACH	RN/L	PARAMETRIC VALUES
□	-5.000	.600	3.700		3.000 BETA
□	.000	.400			-5.000

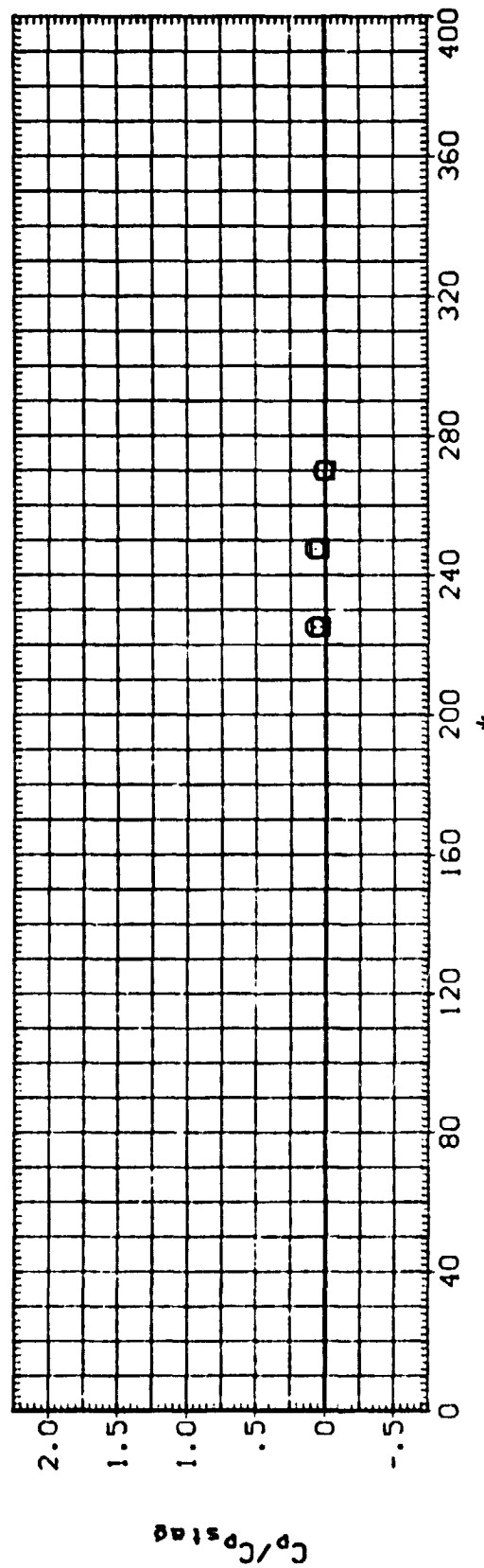
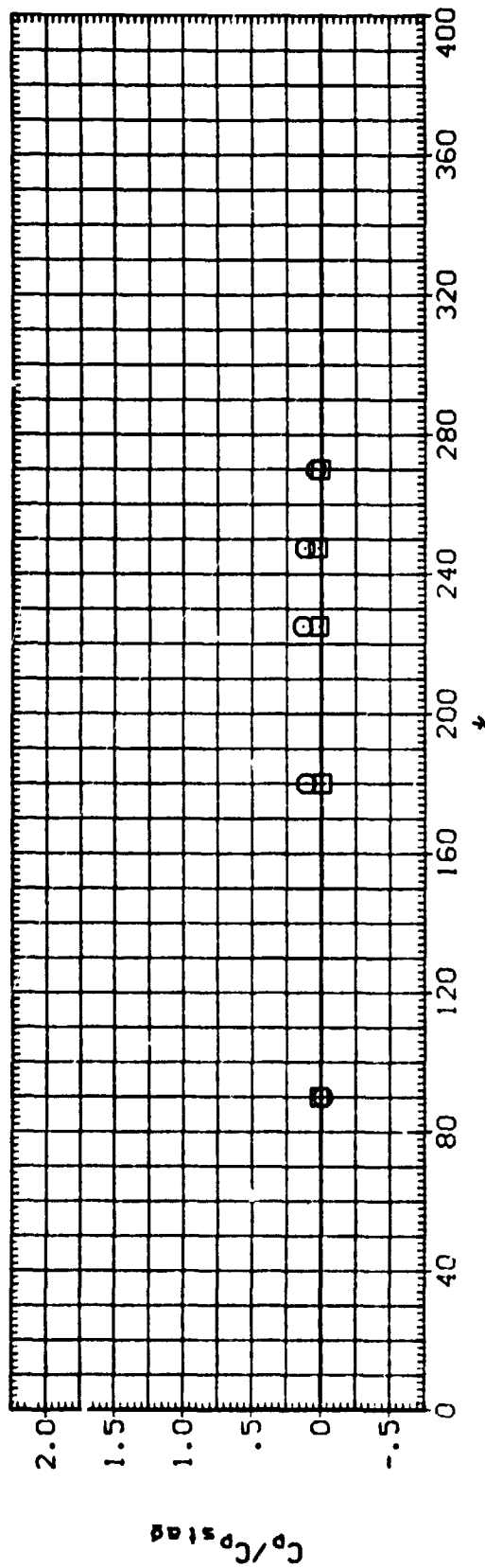


FIG. 9 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(R03SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
-5.000
.000

X/L S88 MACH
.780 3.700

RN/L

PARAMETRIC VALUES
3.000 BETA -5.000

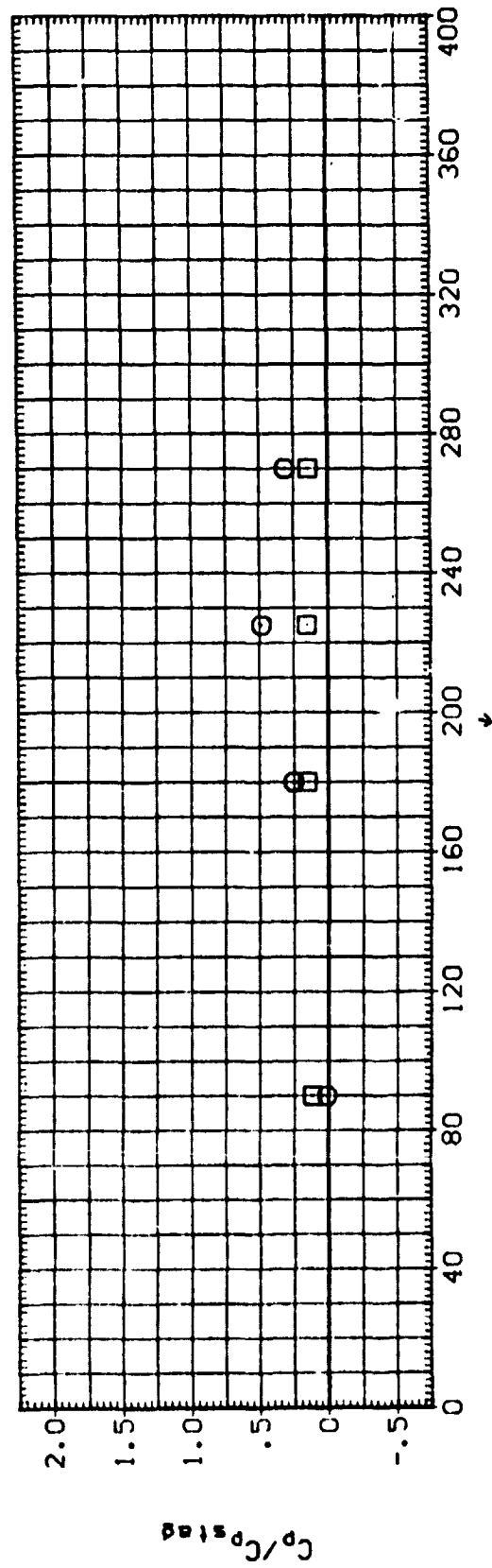
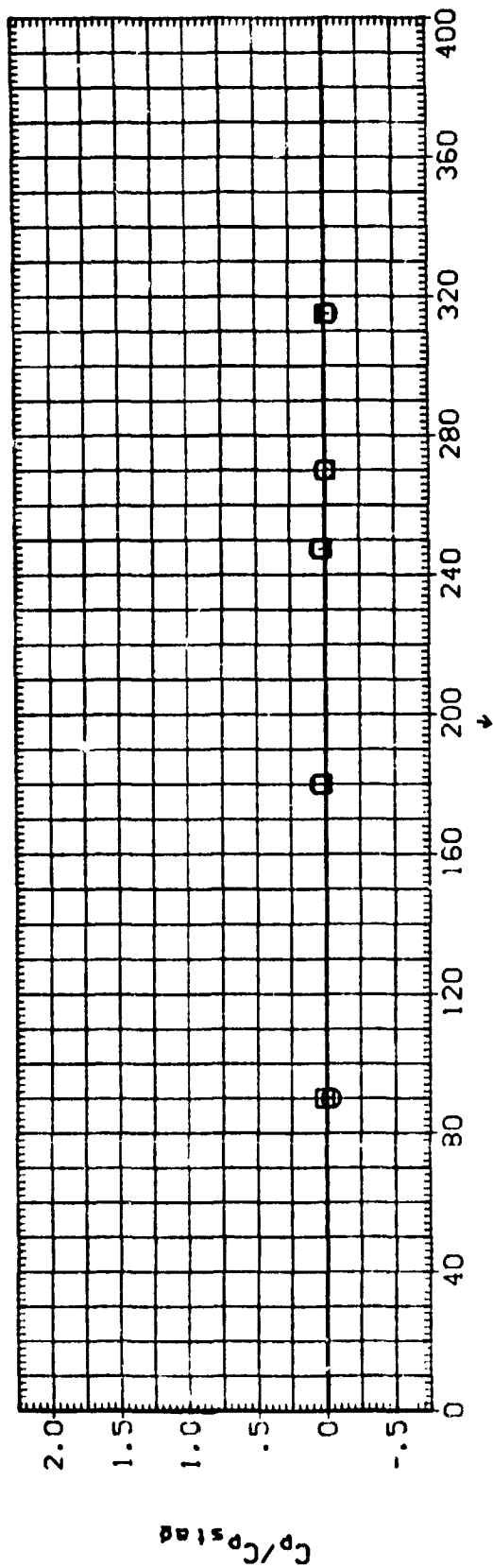


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(RQ3SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
-5.000
.000

X/LSRB
.930
.800

MACH
3.700

RN/L

PARAMETRIC VALUES
3.000 BETA

-5.000

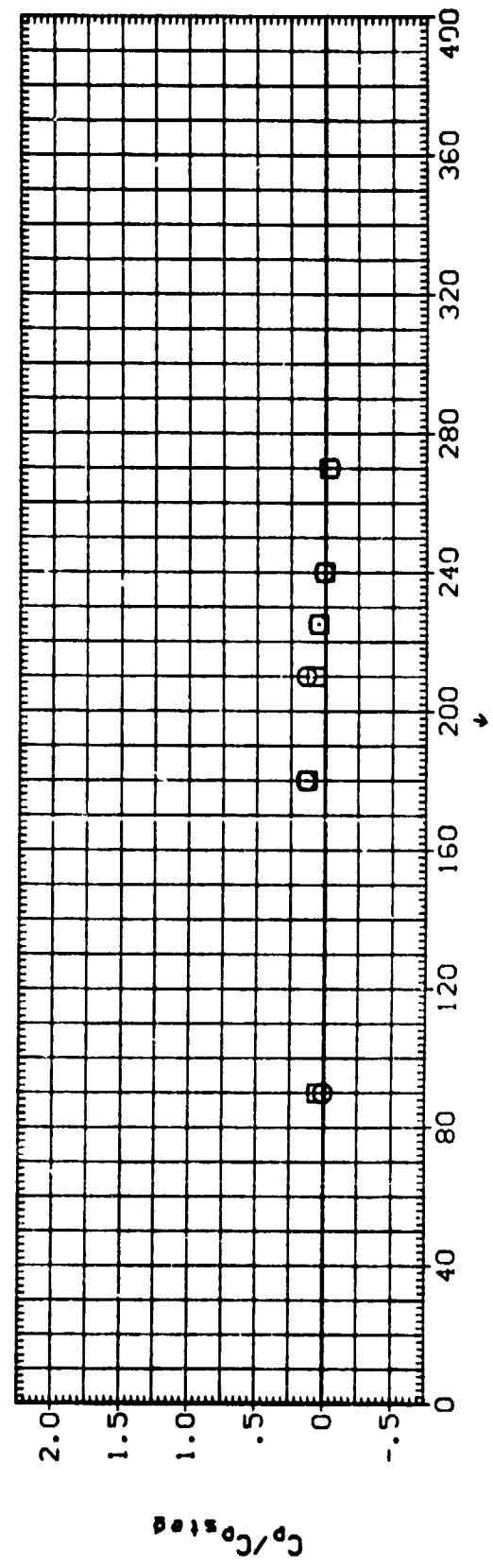
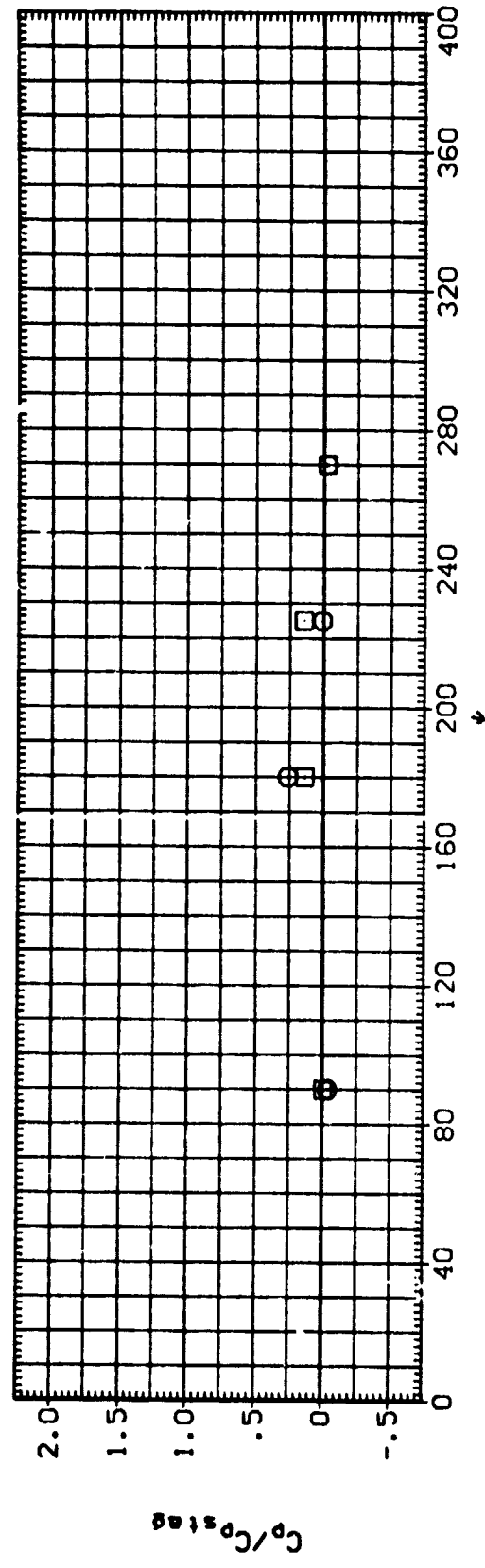


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(R03SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSR8 MACH
 -5.000 .990 3.700
 .000 .960

PAPAMETRIC VALUES
 RN/L 3.000 BETA -5.000

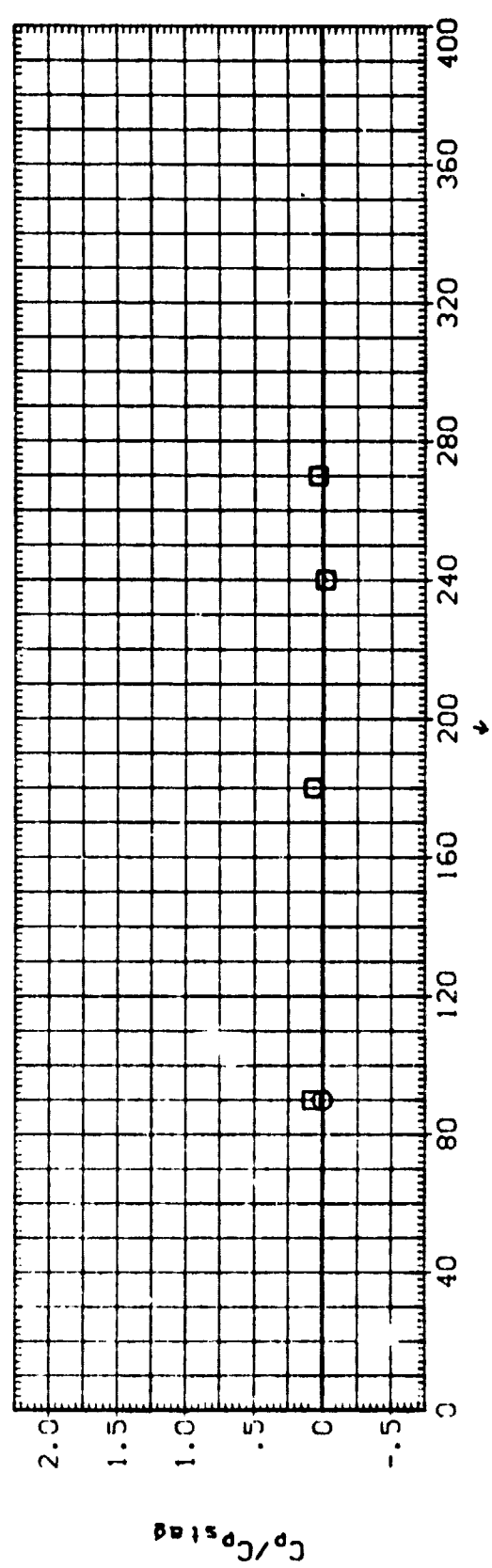
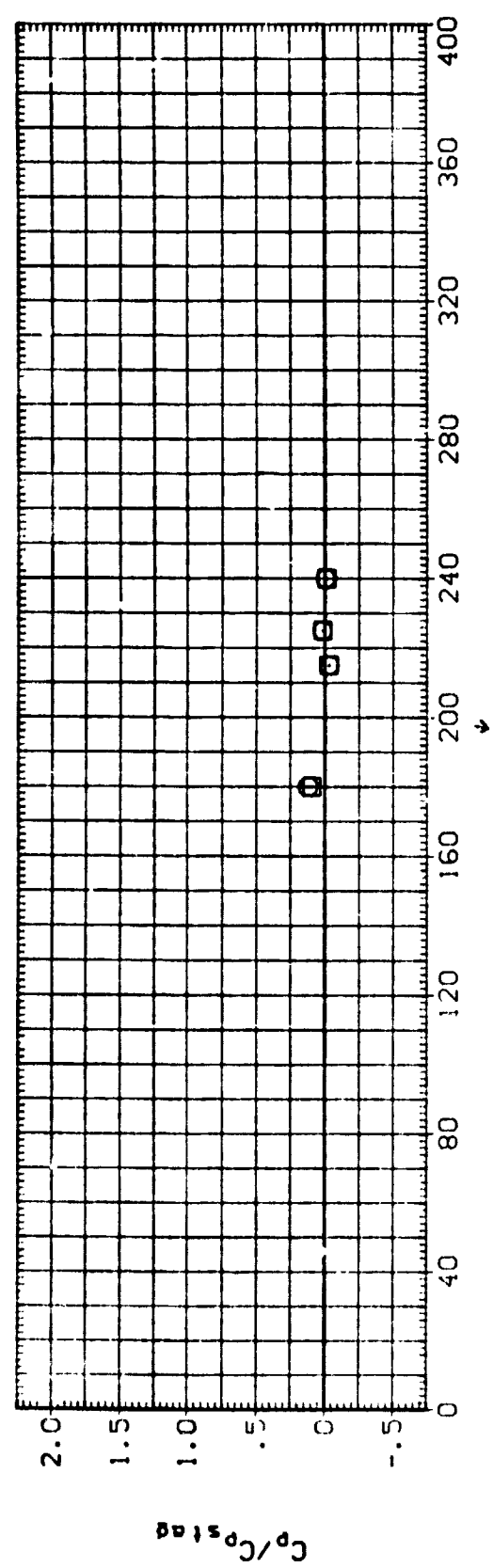


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(RQ3SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL α ALPHA X/L SRB MACH
 -5.000 .500 4.500
 .000

PARAMETRIC VALUES
 RN/L 3.000 BETA -3.000

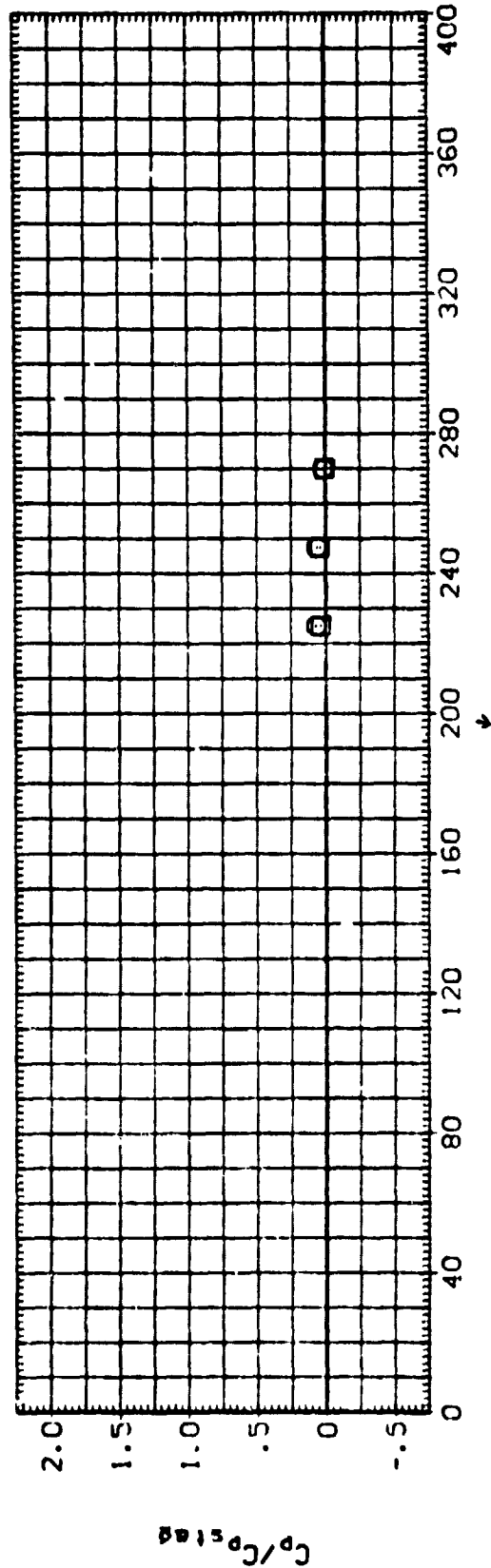
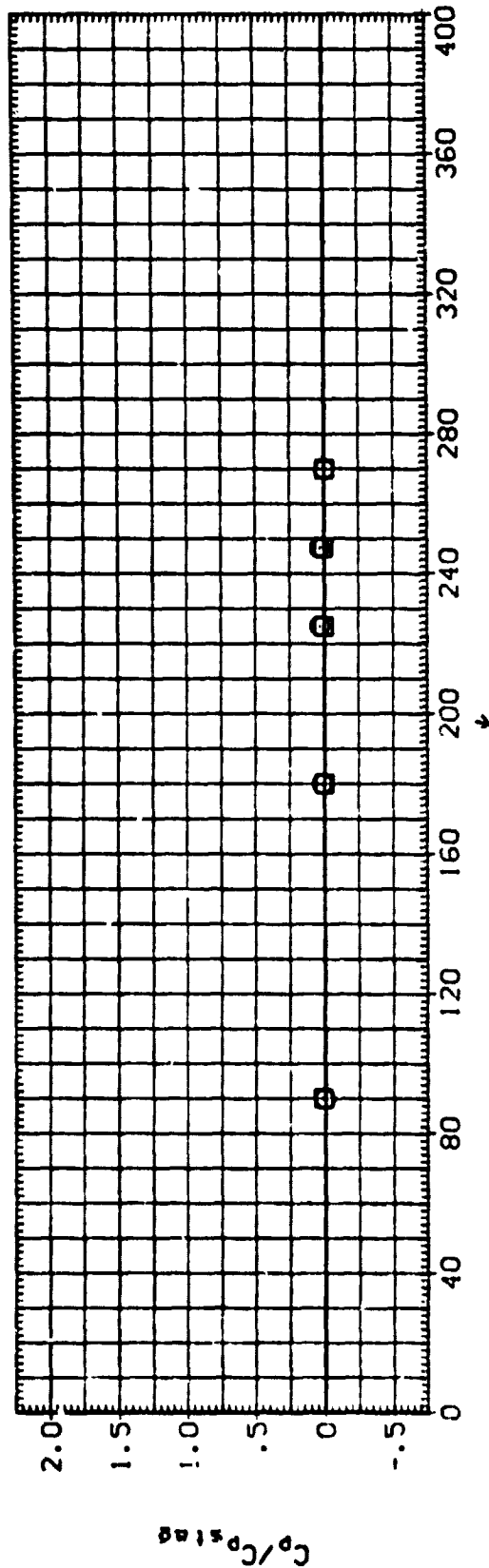


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(R03SAD) UPWT 1059 (JH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
8 -3.000
.000

X/LSR8 MACH
.780 4.600
.700

PARAMETRIC VALUES
RN/L 3.000 BETA -5.000

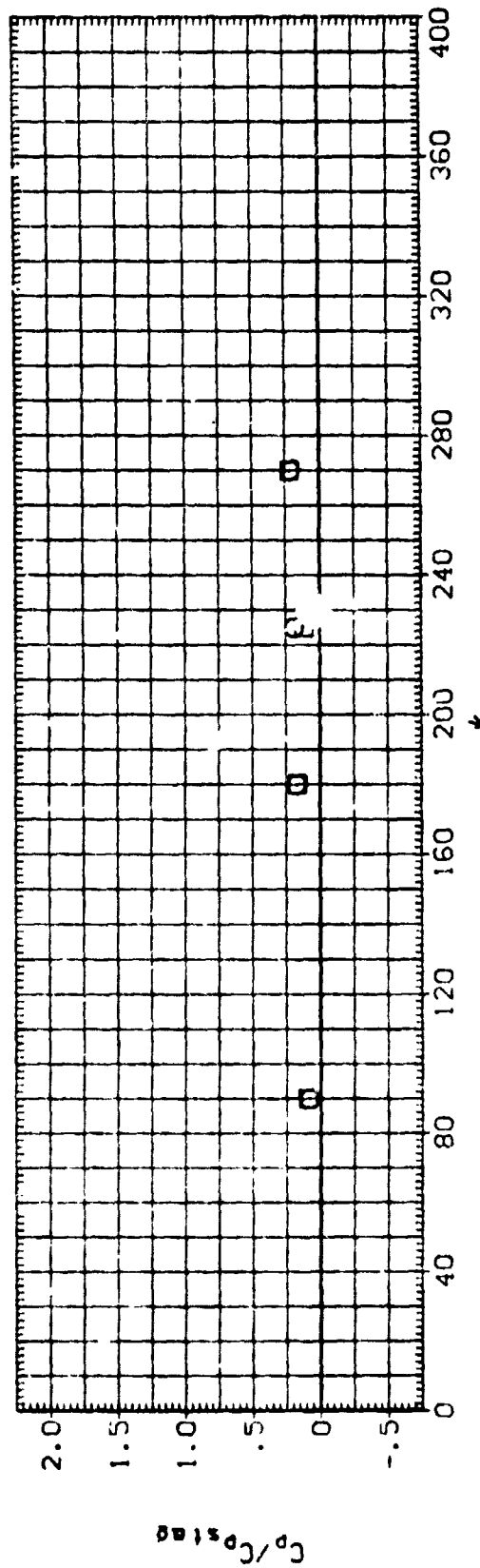
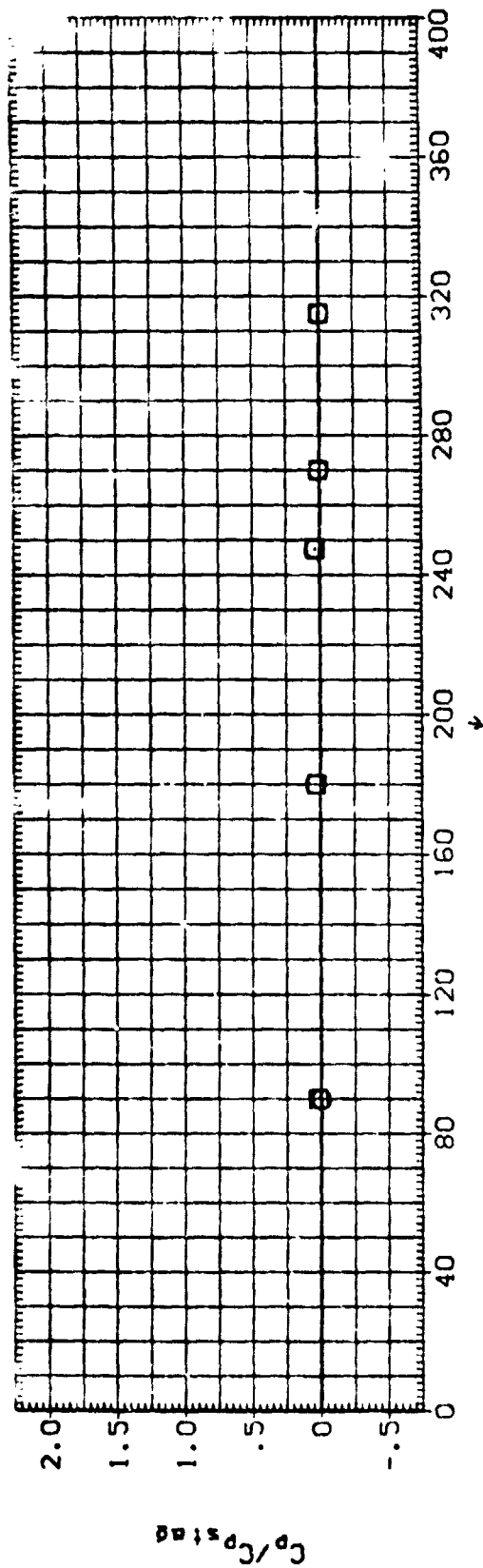


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(R03SAD) UPWT 1059 (IH4) 31-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	X/LSRB	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.930	4.613		3.000 BETA -3.000
□	.000	.800			

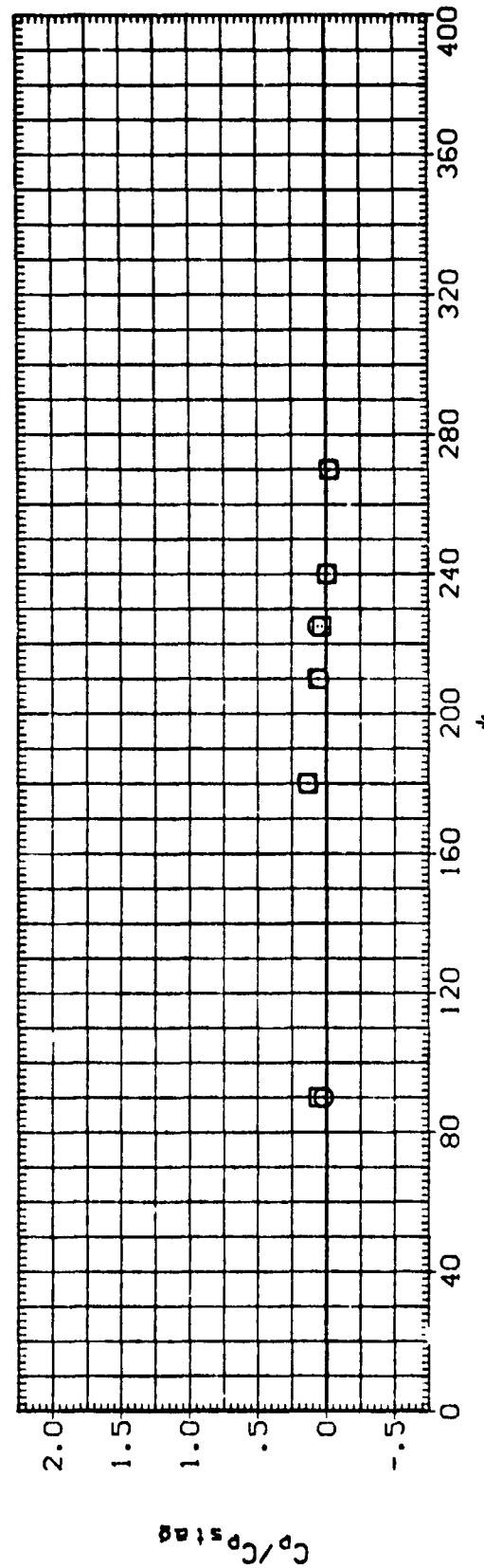
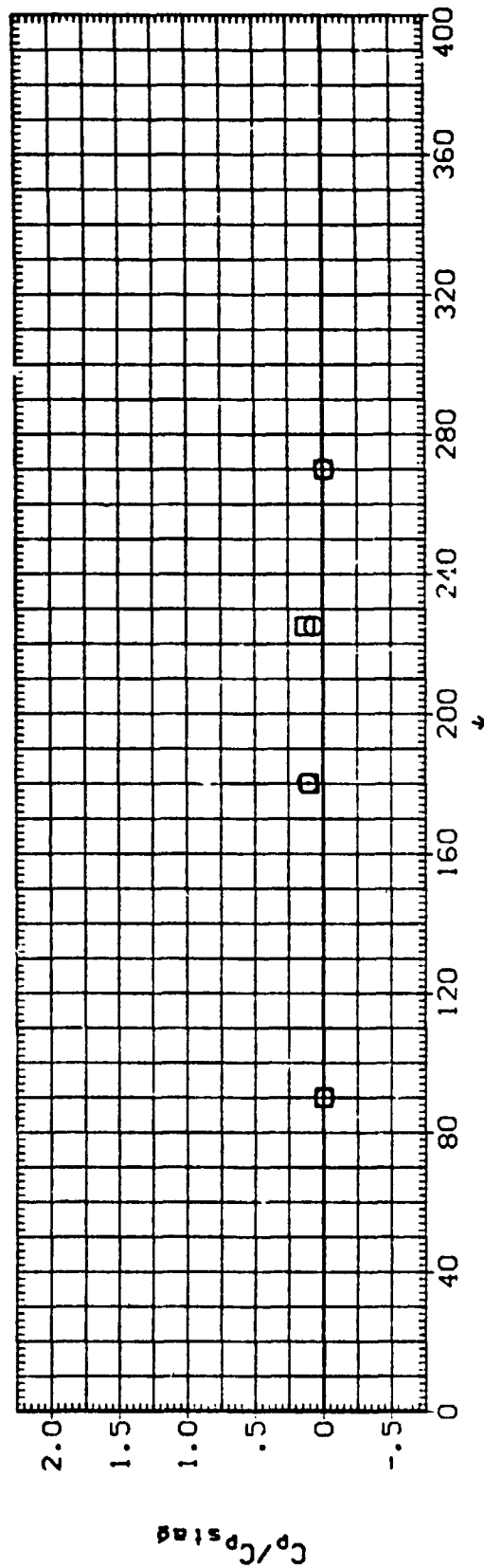


FIG. 9 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(RQ3SAD) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
-5.000
.000

X/LSRB
.990
.960

MACH
4.600

PARAMETRIC VALUES
3.000 BETA

RN/L

-5.000

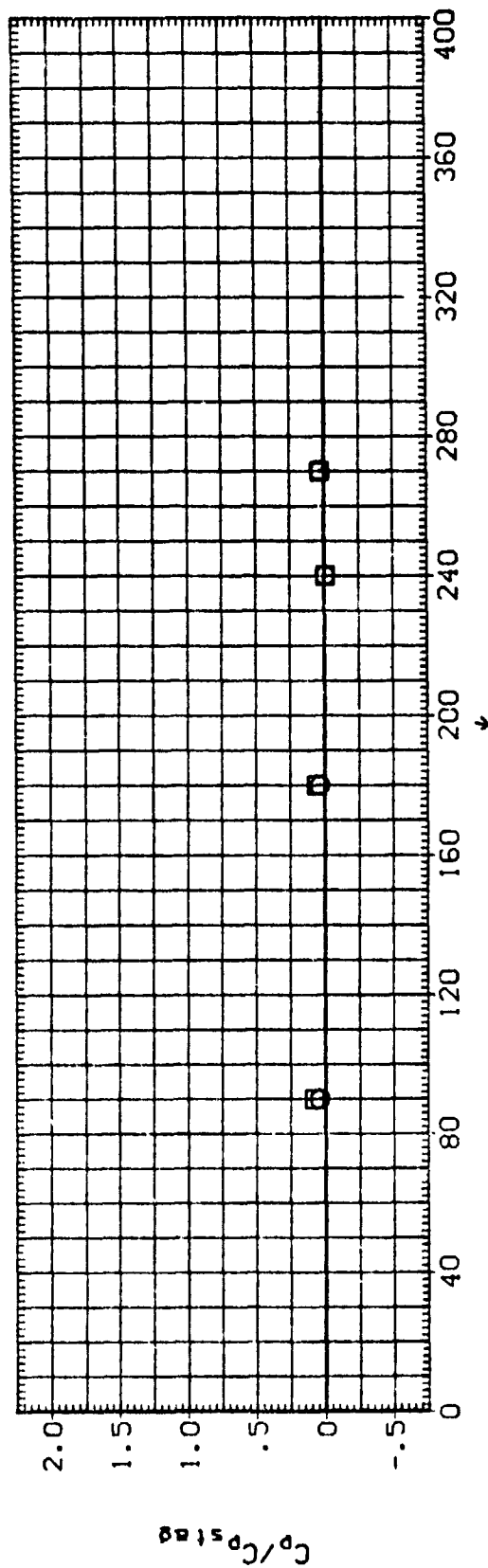
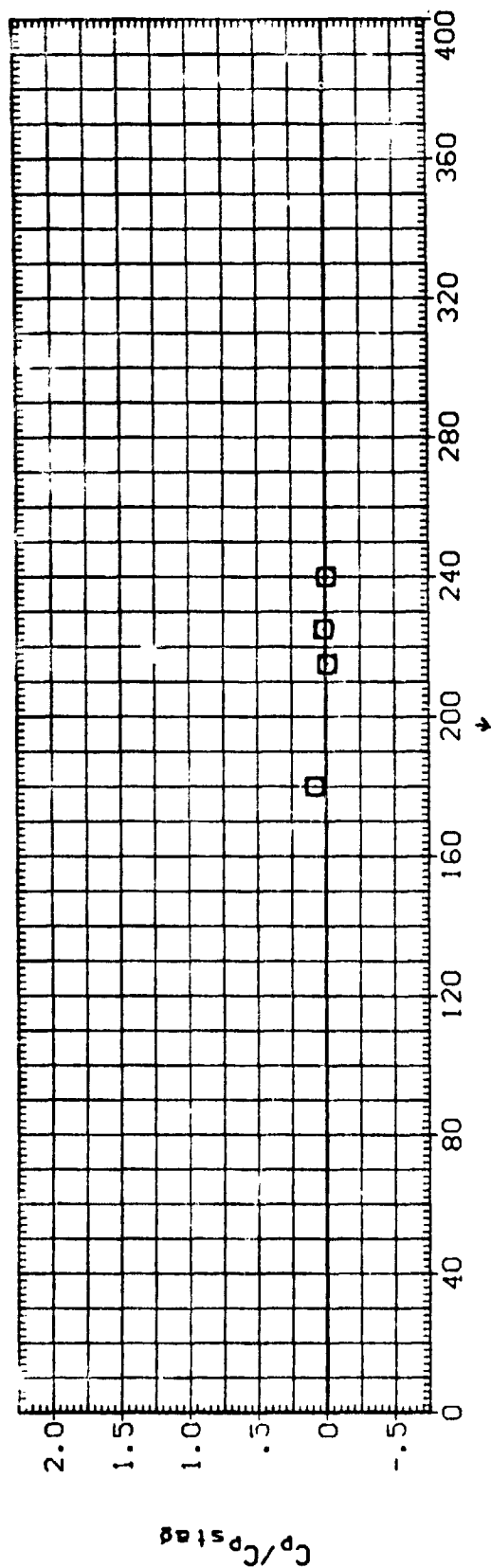


FIG. 9 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA=-5. RN/L= 3.0

(RQ38AA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA PHI MACH
 □ .000 95.000 2.360
 □ 5.000 .000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

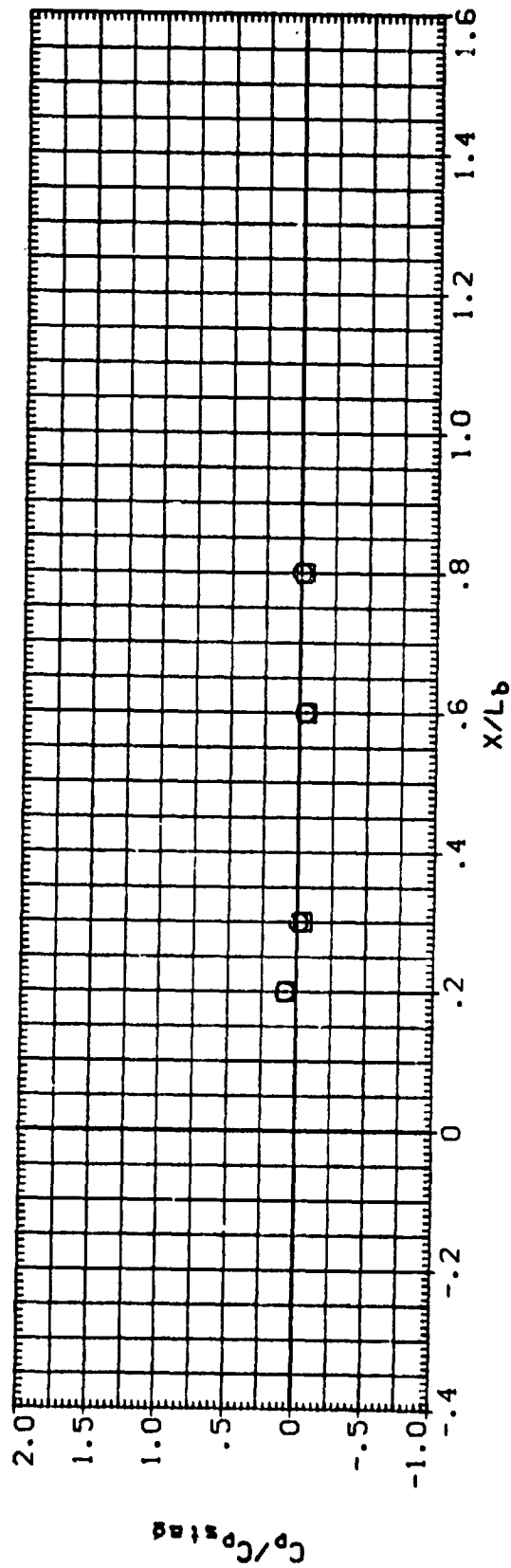
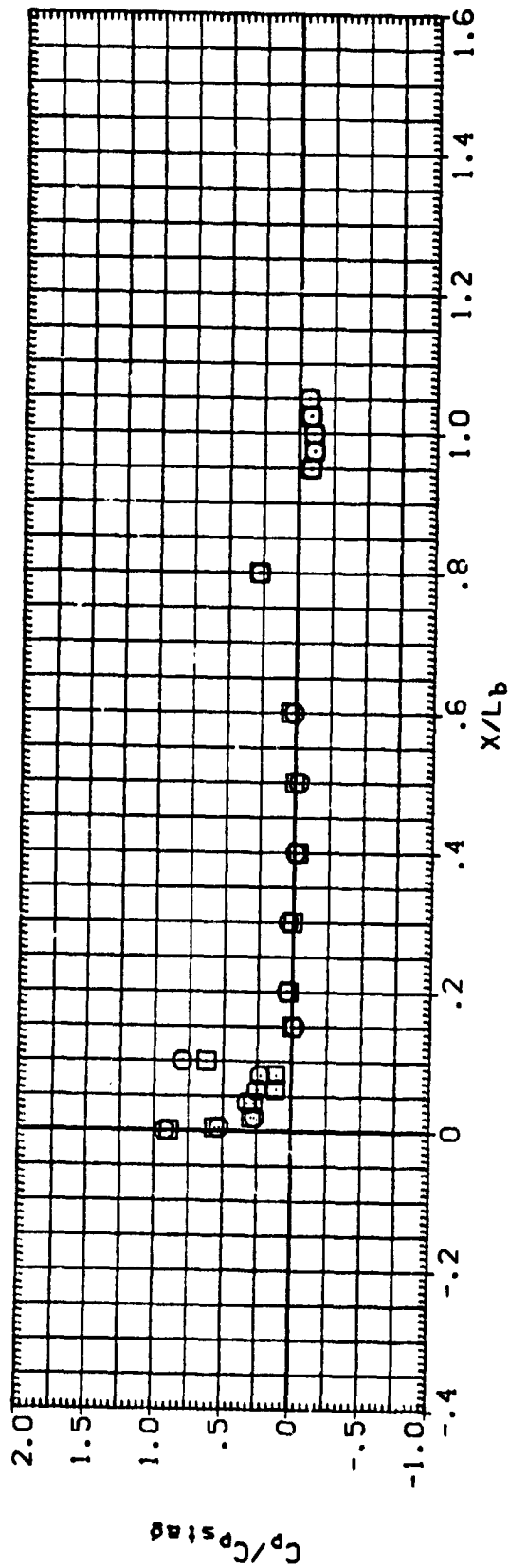


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

(RQ3BAA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	.000	180.000	2.360	1.200	BETA
	5.000	122.700			.000

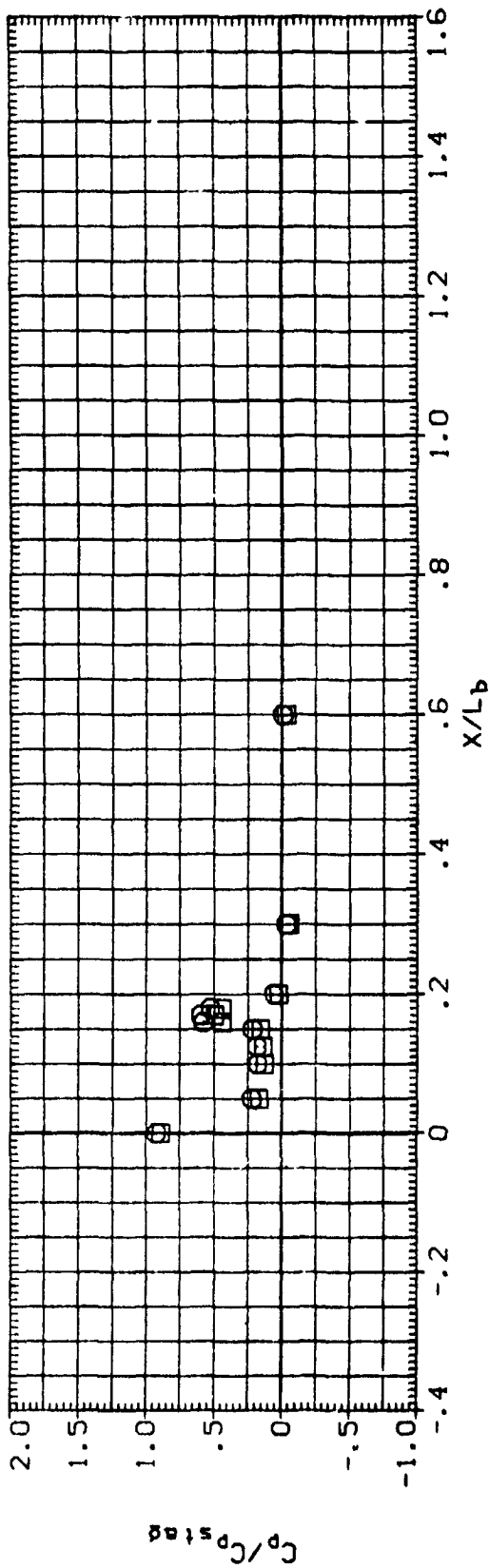
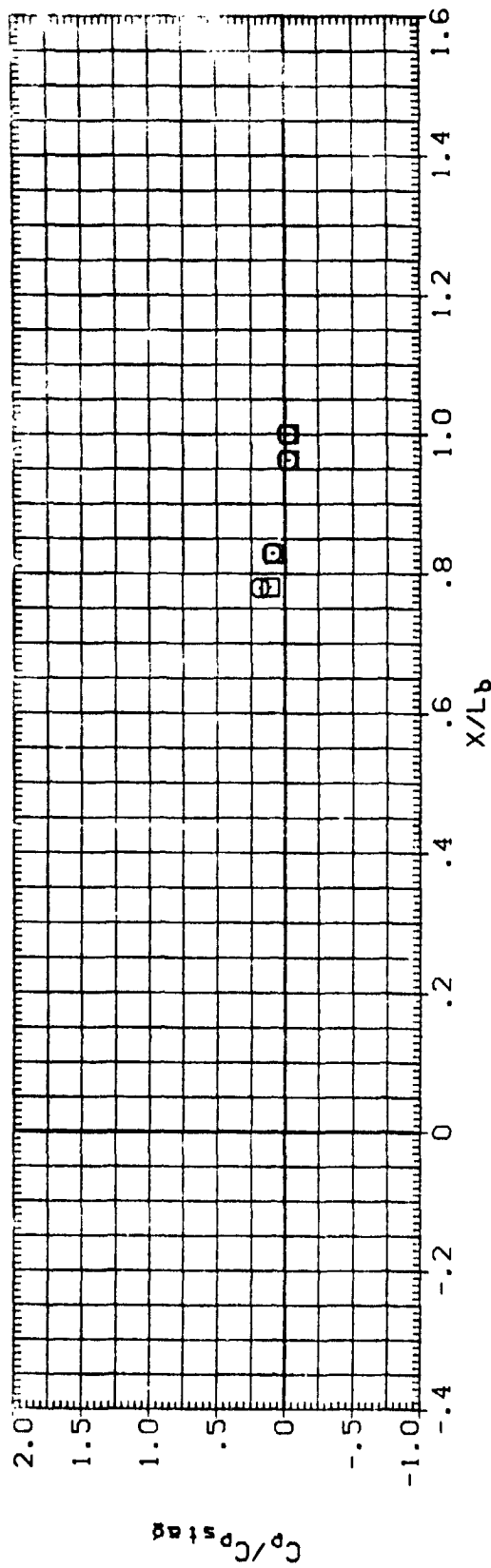


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

D

(R03BAA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	.000	95.000	2.950	1.200	BETA
	5.000	.000			.000

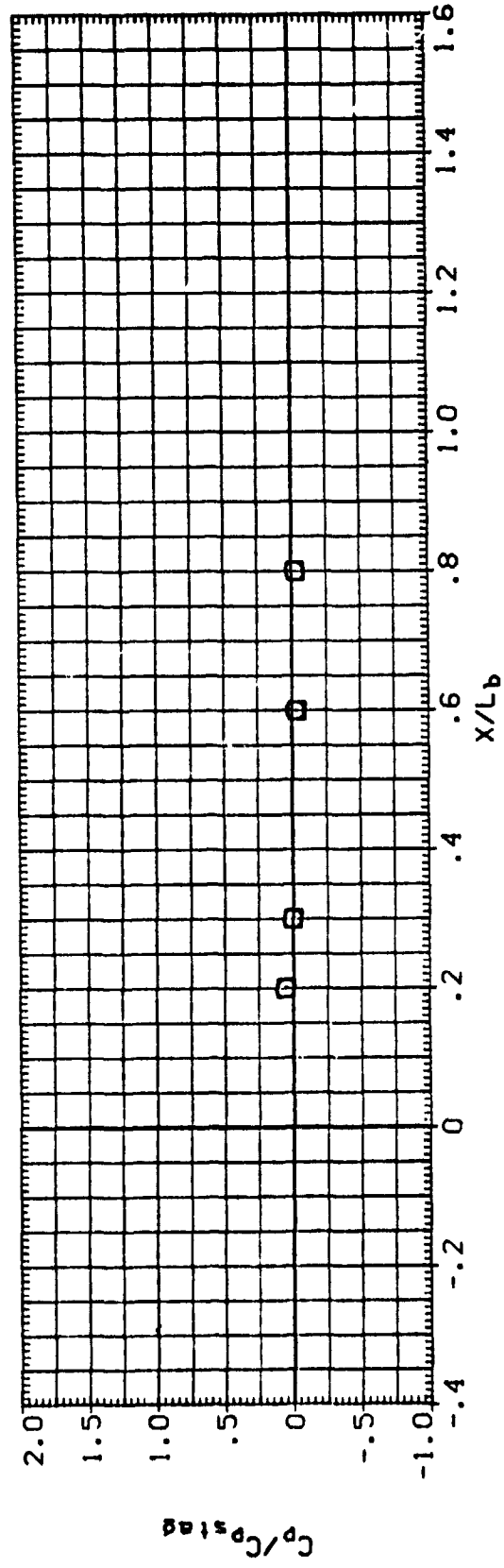
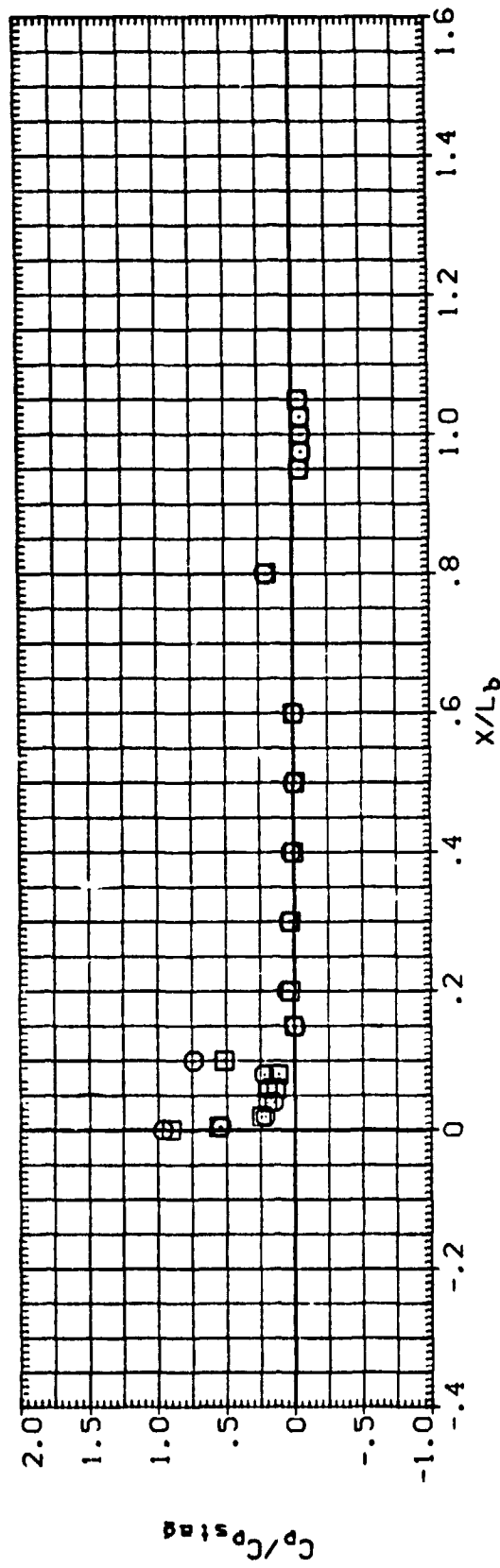


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0, RN/L= 1.2

(R03BAA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	5.000	180.000	2.950	1.200	BETA
		122.700			.000

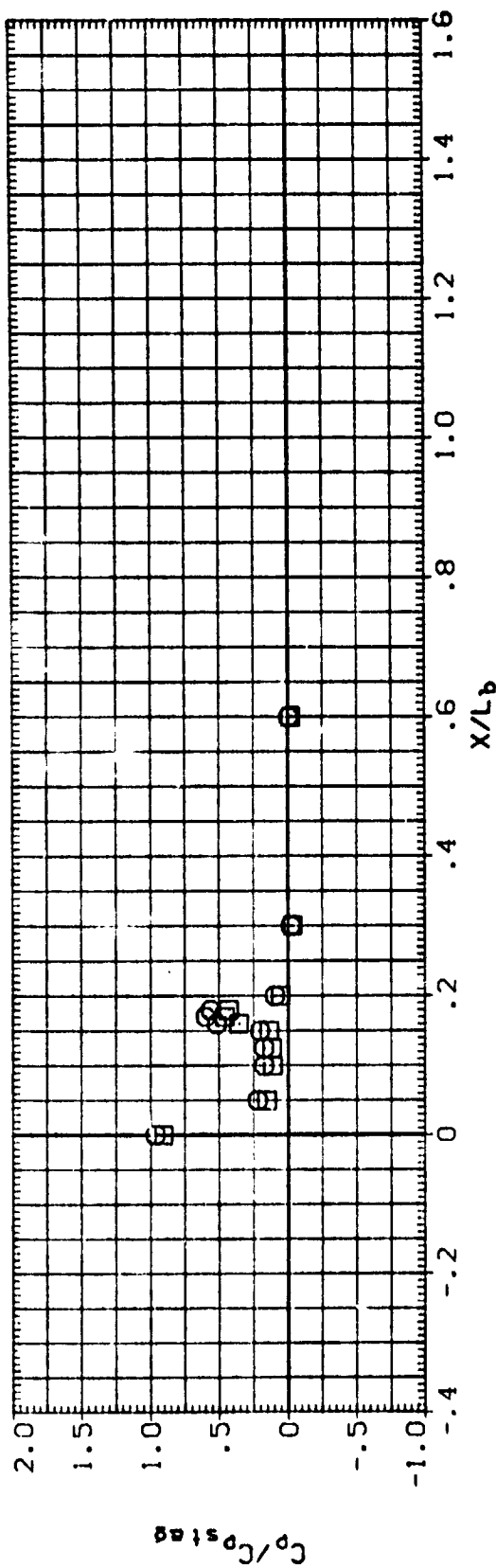
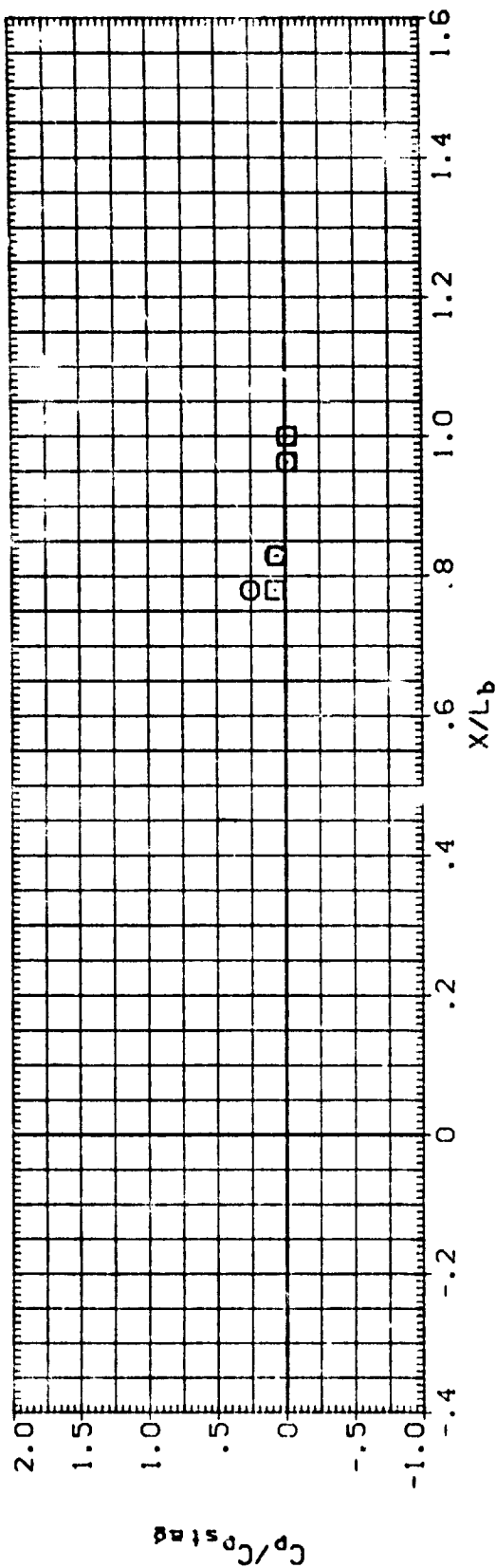


FIG. 10 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA = 0. RN/L = 1.2

(R038AA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA PHI MACH
 □ -5.000 95.000 3.700

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

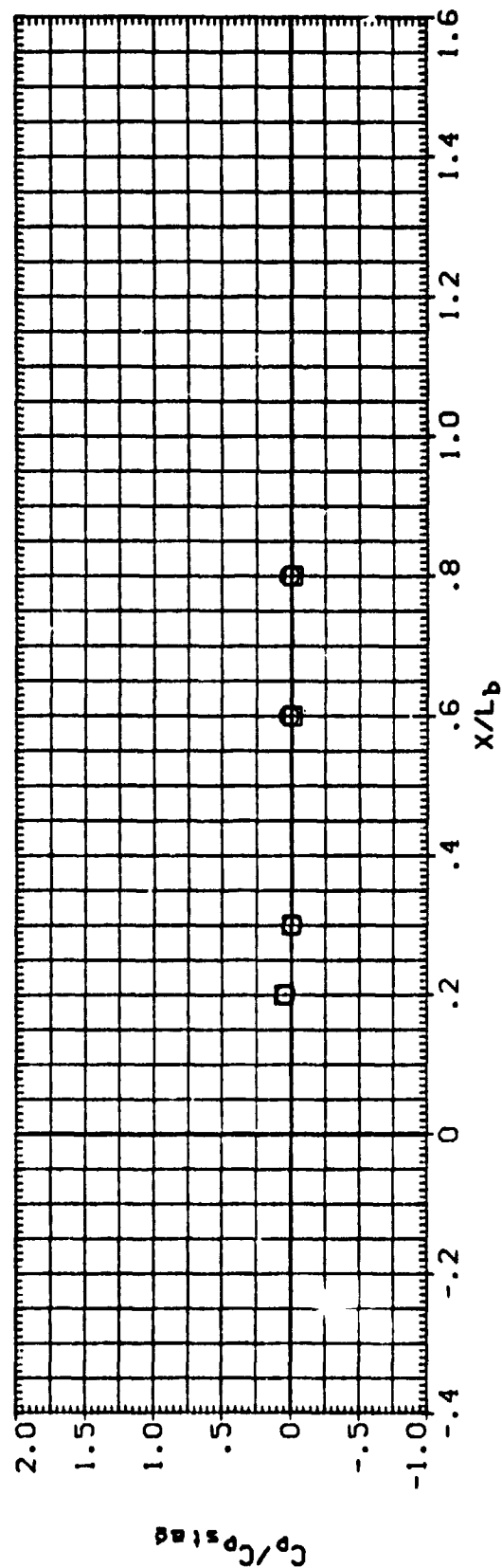
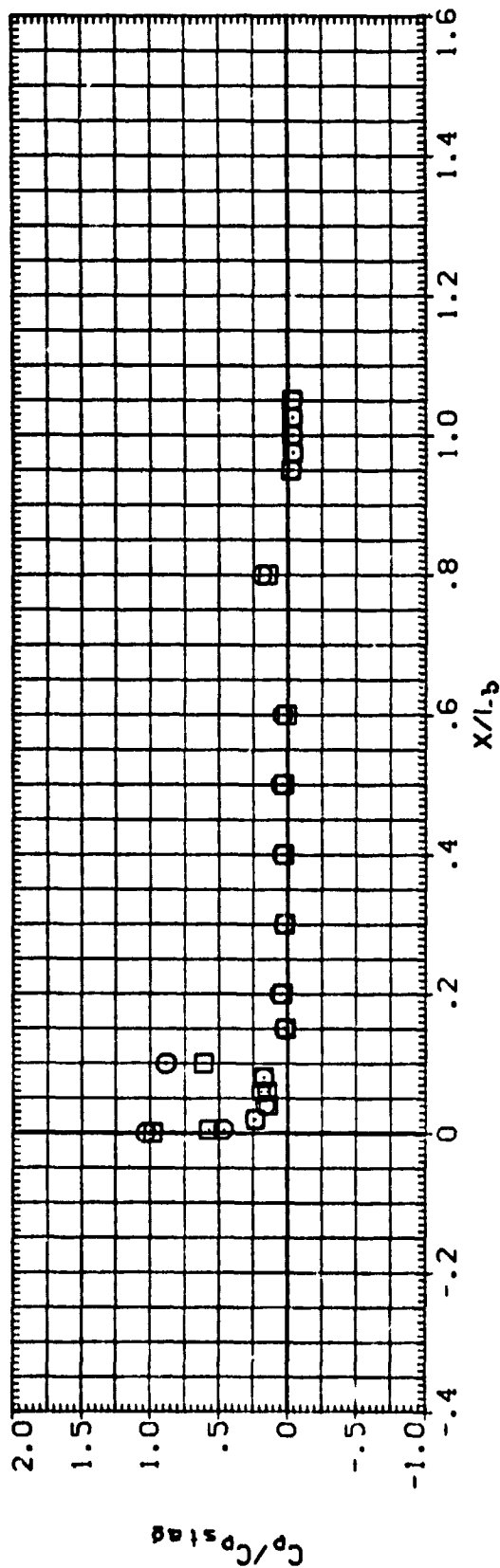


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

(RQ3BAA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	-3.000	180.000	3.700	1.200	BETA
	.000	122.700			.000

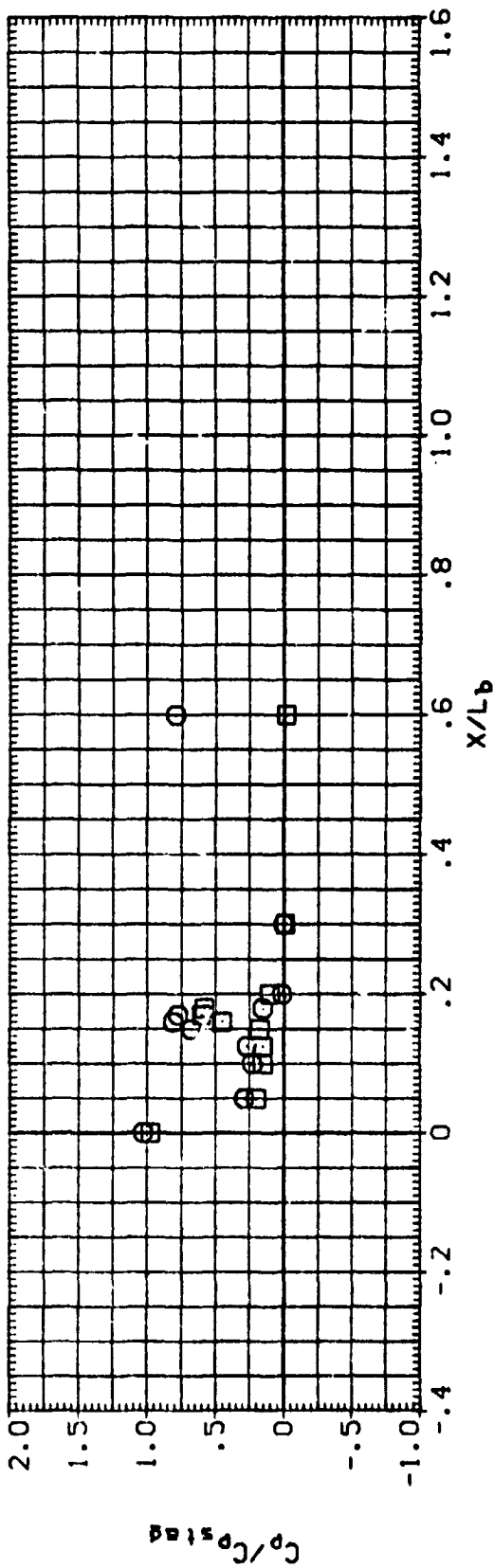
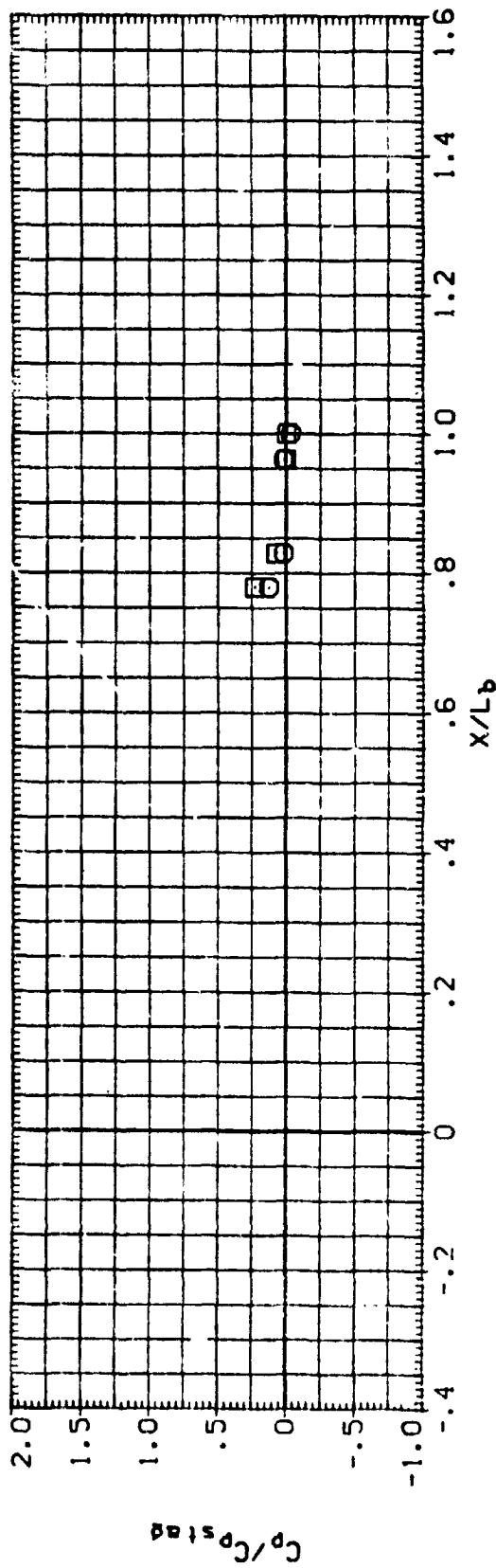


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

(RQ38AA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA -5.000 .000
PMI 95.000 .000
MACH 4.500

PARAMETRIC VALUES
RN/L 1.200
BETA .000

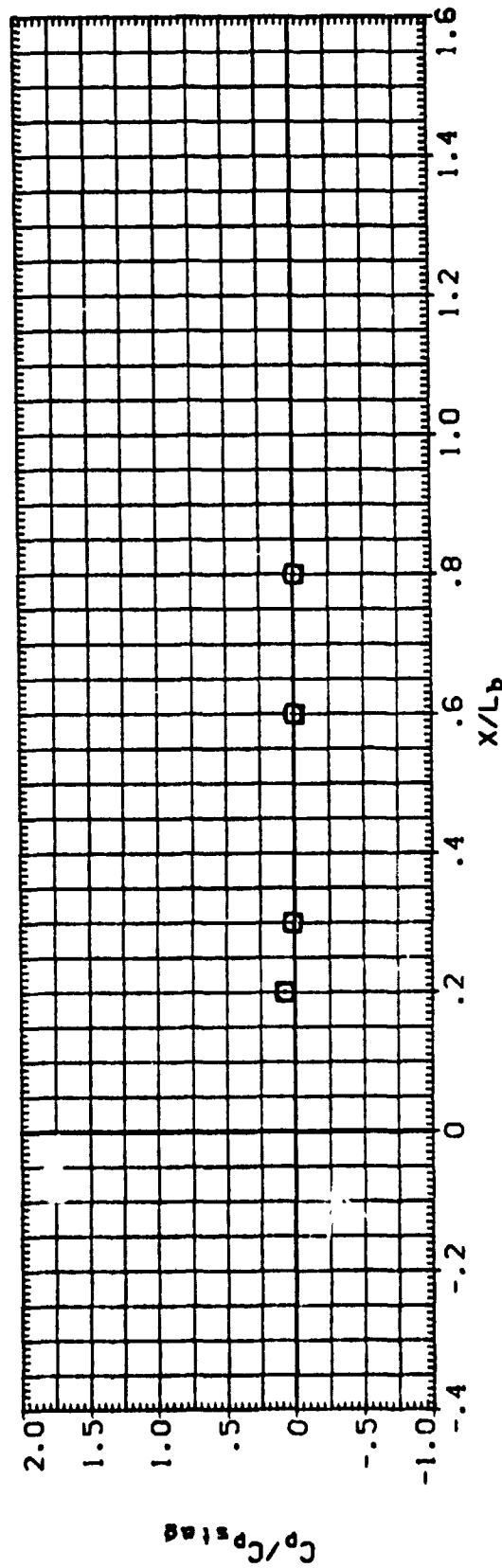
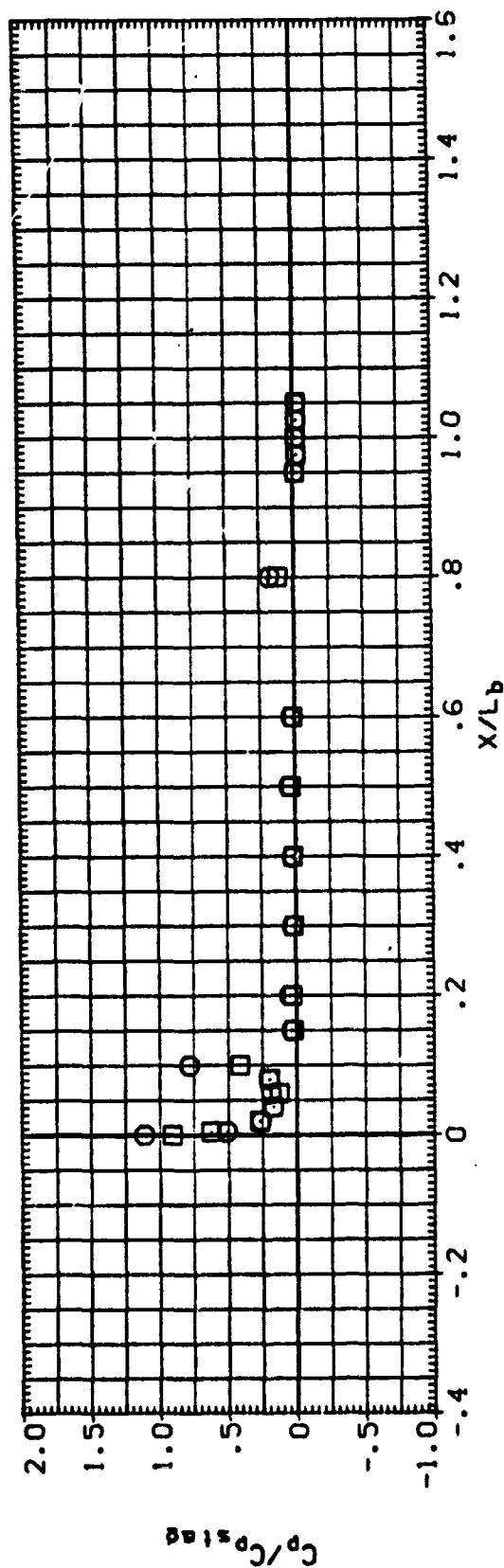


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

(RQ3BAA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES	BETA	
□	-5.000	180.000	4.600		1.200		.000
	.000	122.700					

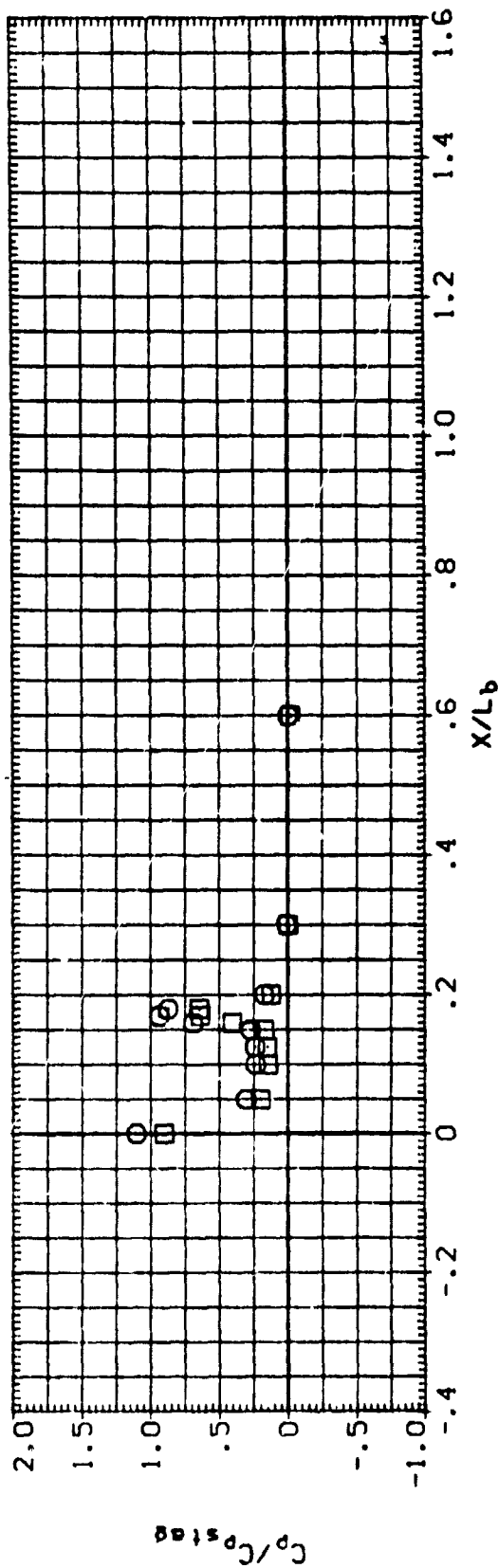
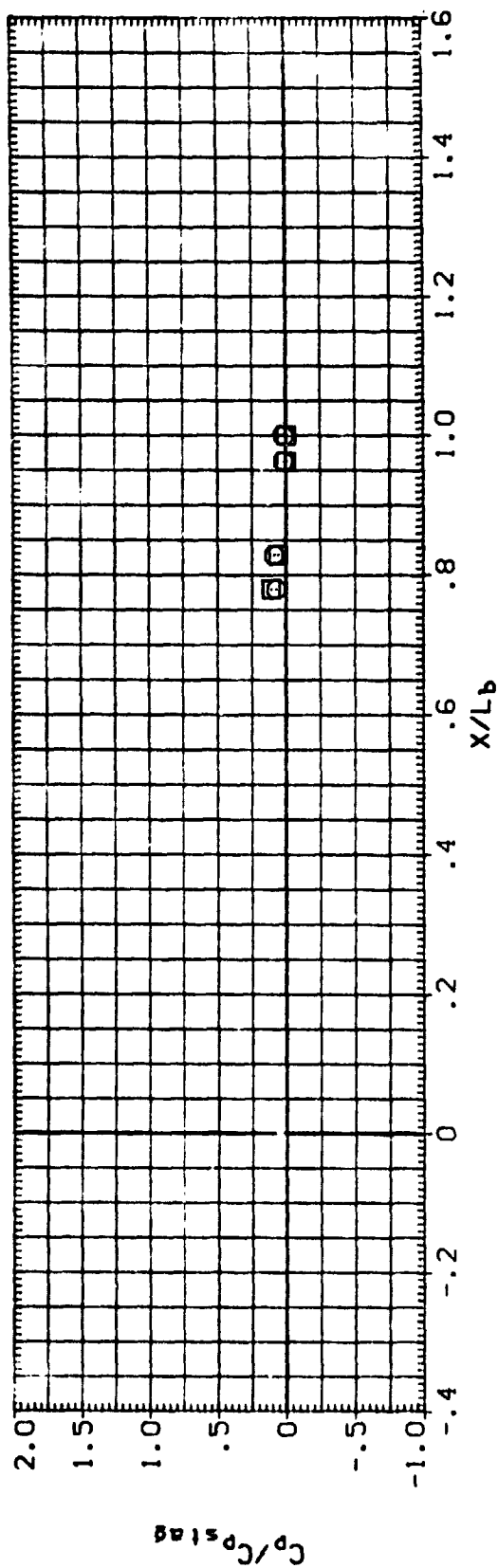


FIG. 10 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

(R038AA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
□	.000	.200	2.360		1.200 BETA .000
□	.500	.100			

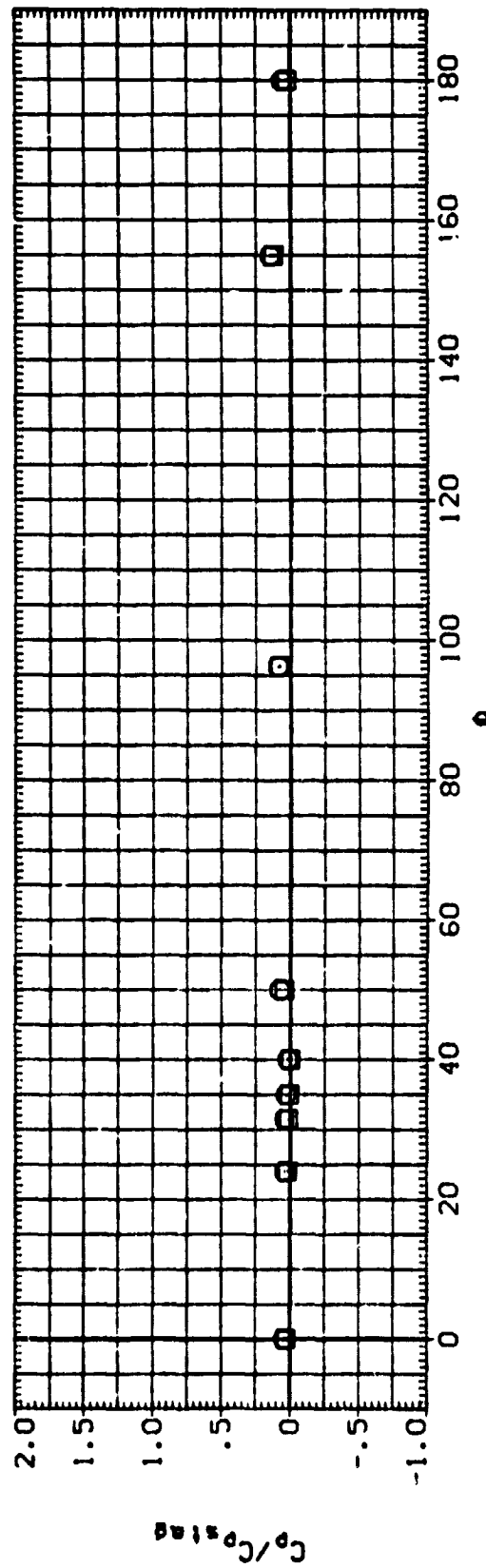
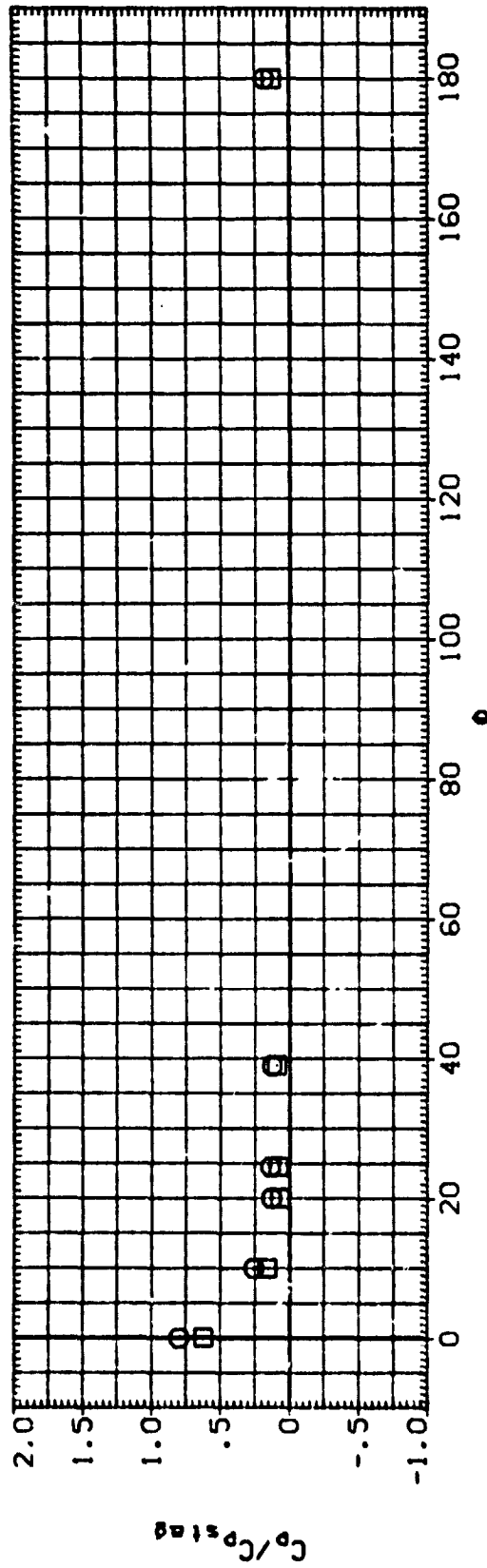


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

(R038AA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA X/LB HACH
 0 .000 5.000 2.360

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

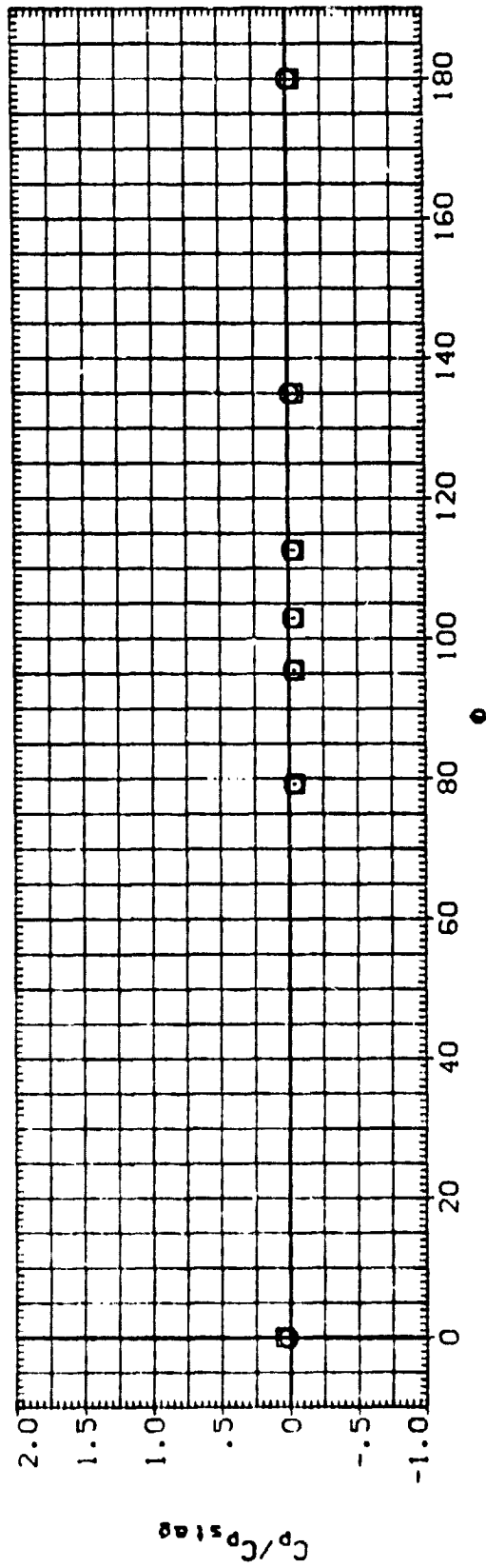
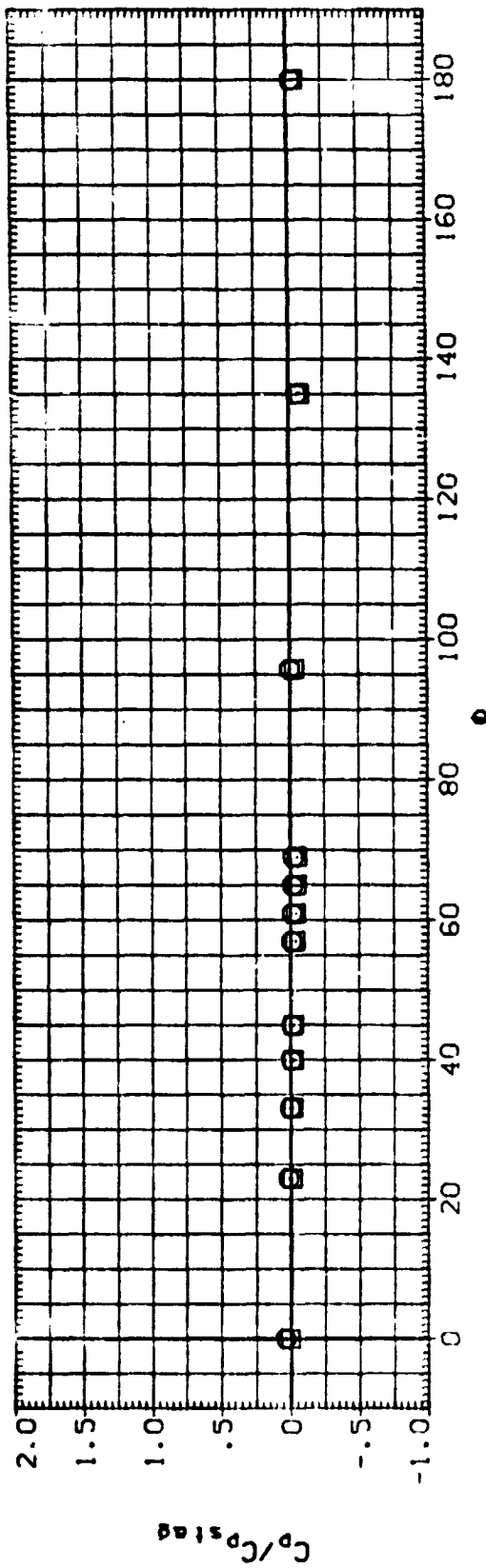


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

(RQ32AA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
0.000	.200	2.950		1.200
0.000	.100			BETA
				.000

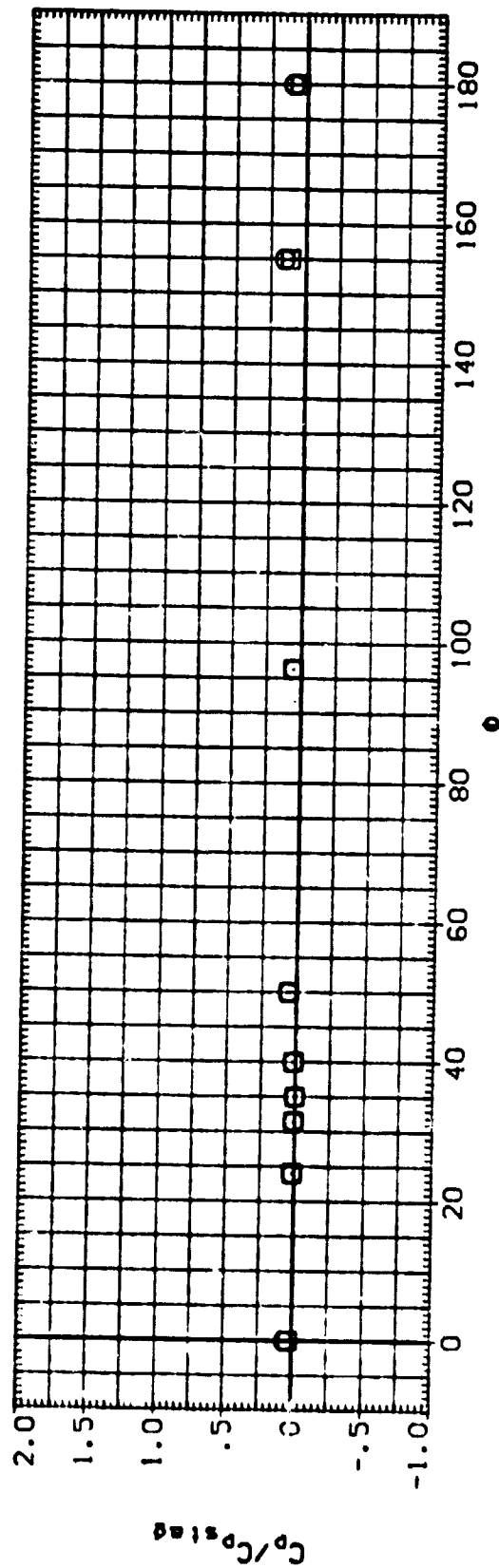
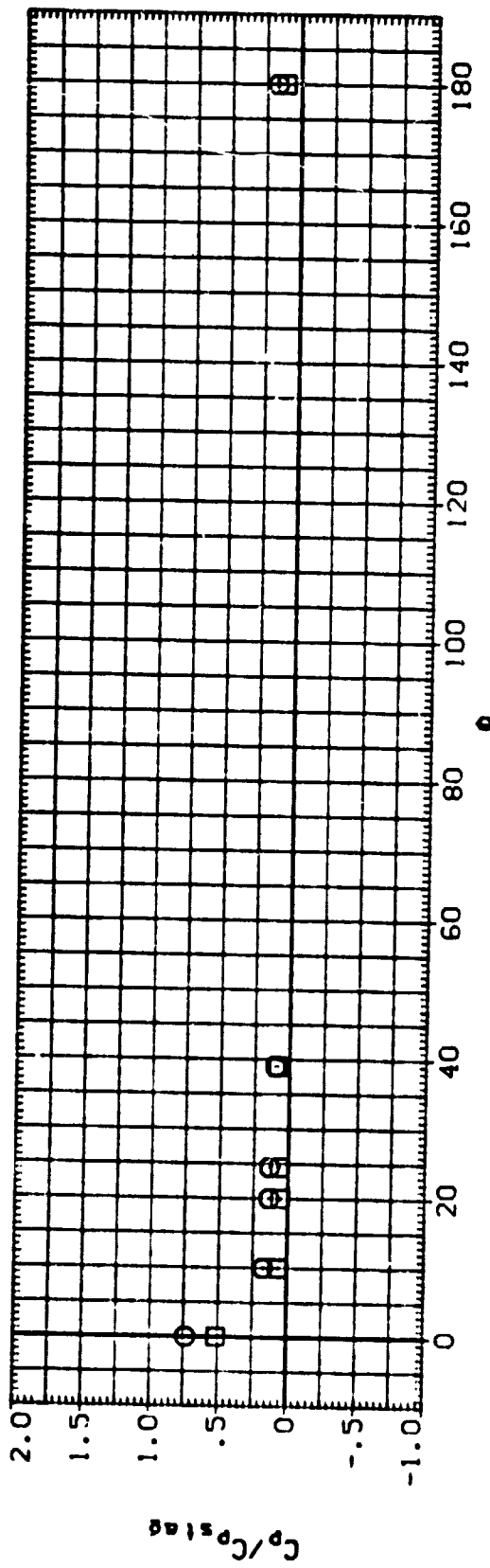


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

(R03BAA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

PARAMETRIC VALUES
1.200 BETA .000

RN/L

MACH 2.950

X/LB .600 .300

ALPHA .000 5.000

SYMBOL

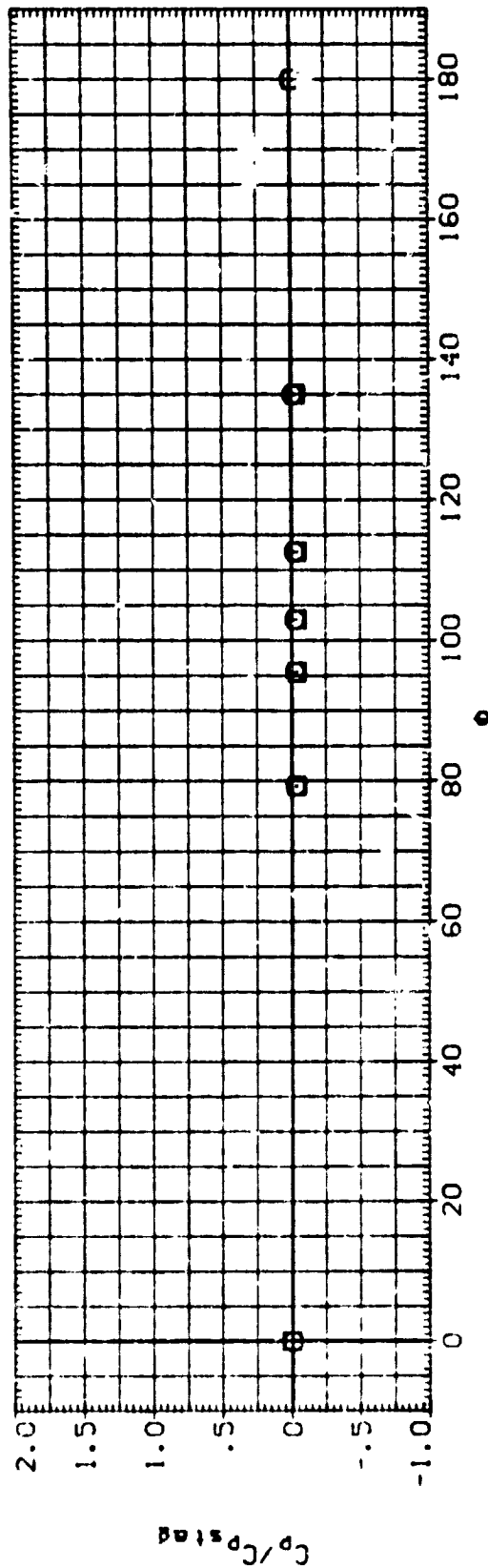
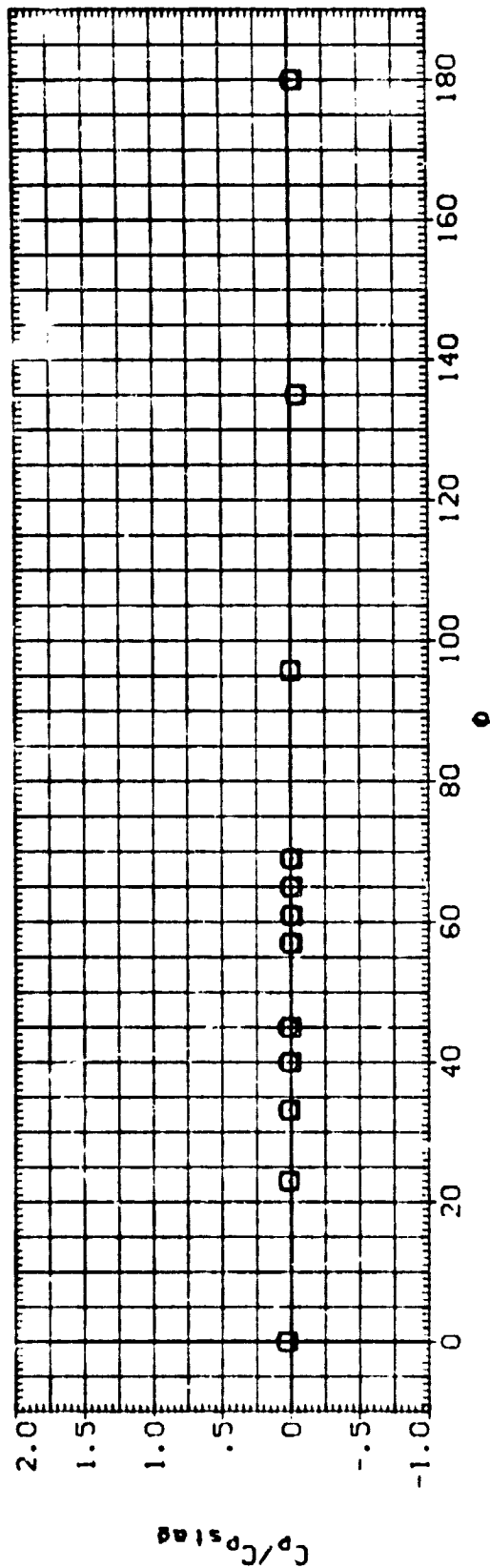


FIG. 10 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

(RQ3BAA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.200	3.700		1.200
	.000	.100			BETA
					.000

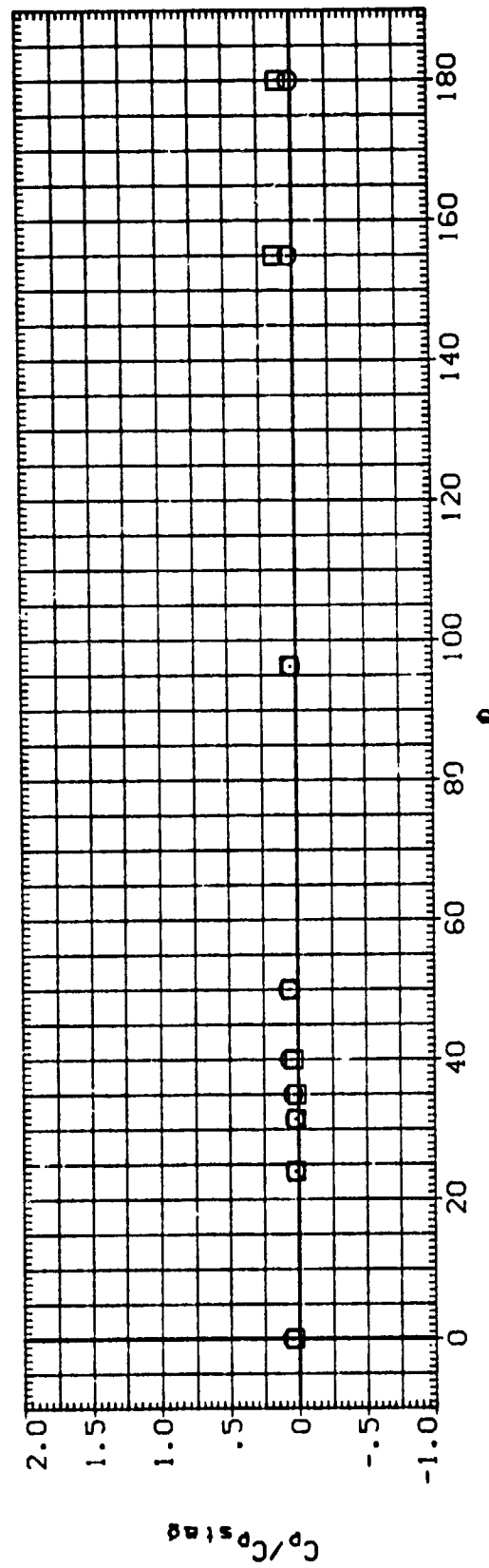
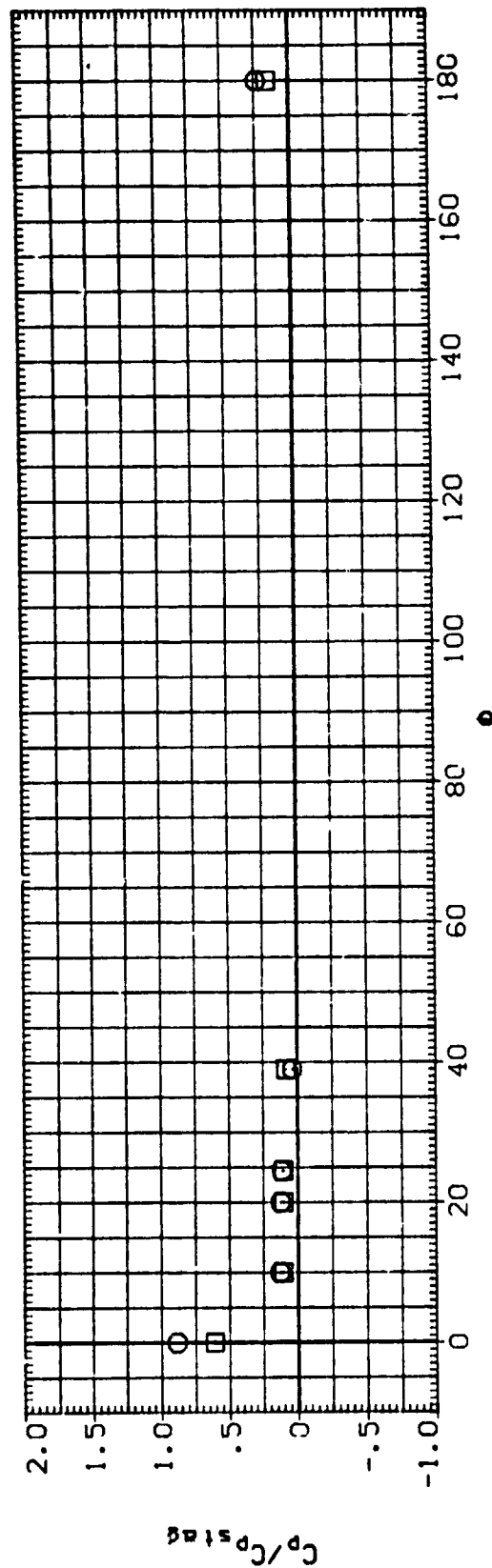


FIG. 10 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 1.2

[R03BAA] UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPH/ X/LB MACH
 -5.000 600 3.700
 .000 .300

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

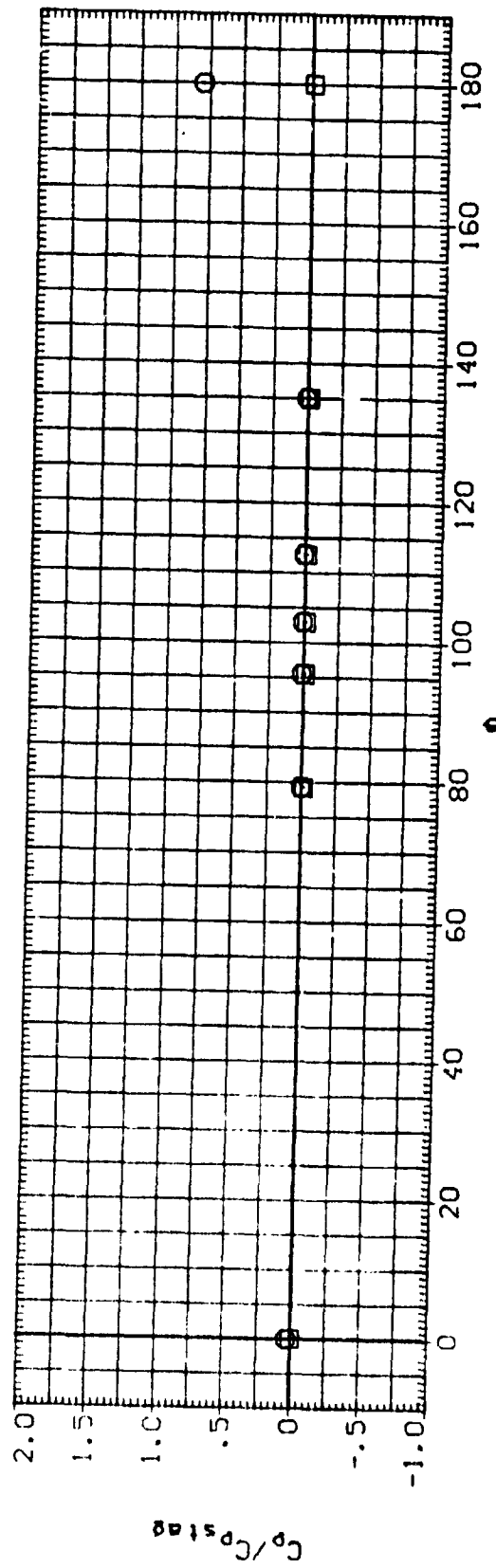
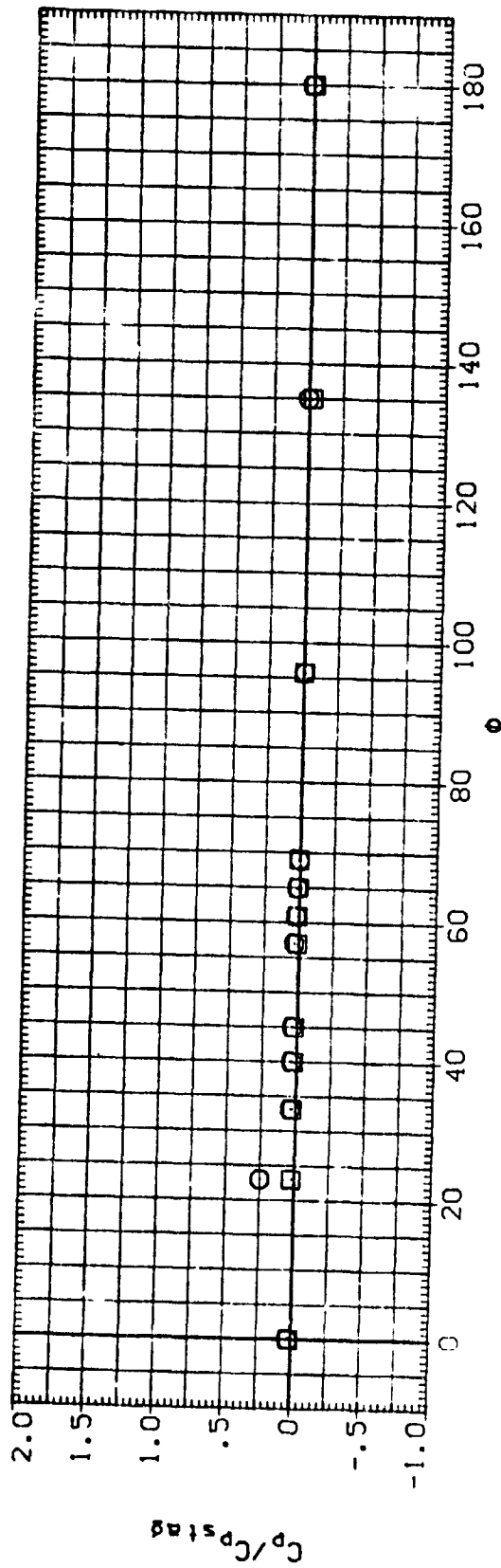


FIG. 10 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, ORBITER FUSELAGE, BETA= 0, RN/L= 1.2

(RQ38AA) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

PARAMETRIC VALUES

1.200 3ET/

RN/L

MACH

4.500

X/LB

.600 .300

ALPHA

-5.000 .000

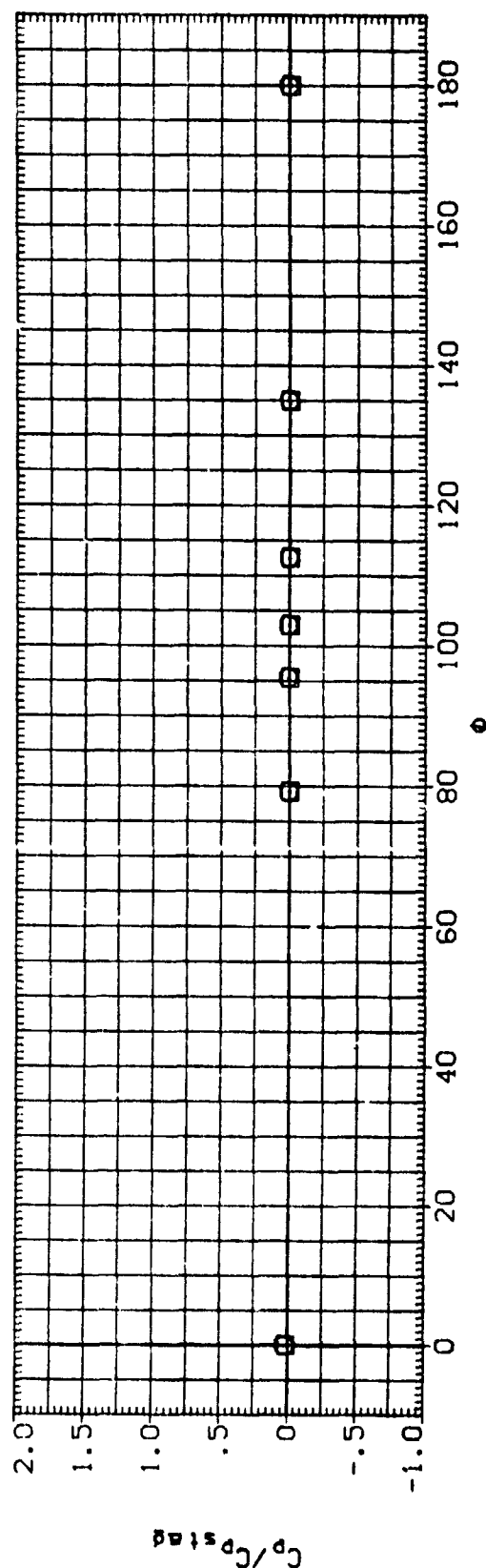
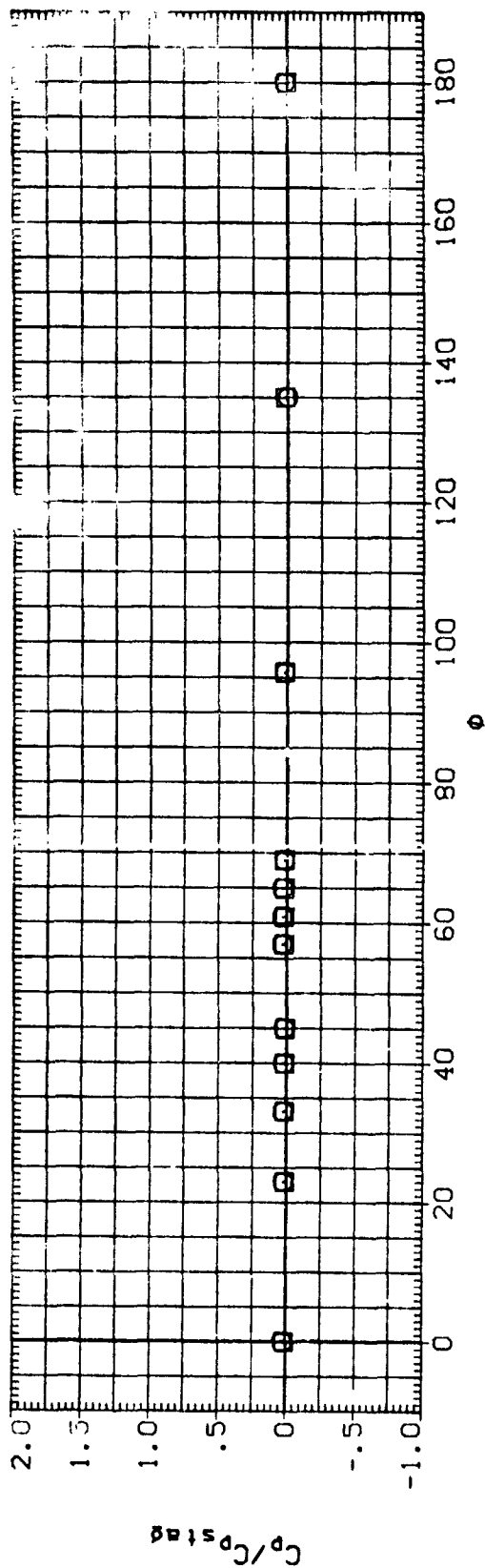


FIG. 10 VARIATION OF $C_p/C_{p_{stag}}$ ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE, $BETA = 0$. $RN/L = 1.2$

(RQ3LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2Y/BV	MACH	RN/L	PARAMETRIC VALUES
□	-0.000	.400	2.360		1.200 BETA .000
○	5.000	.250			

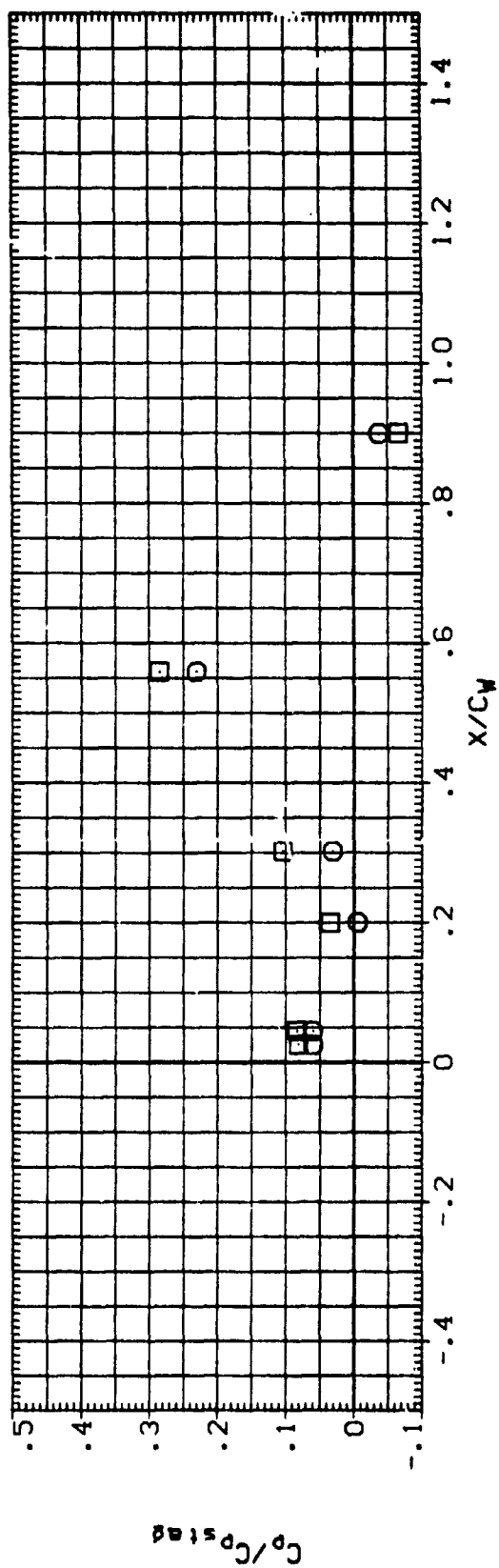
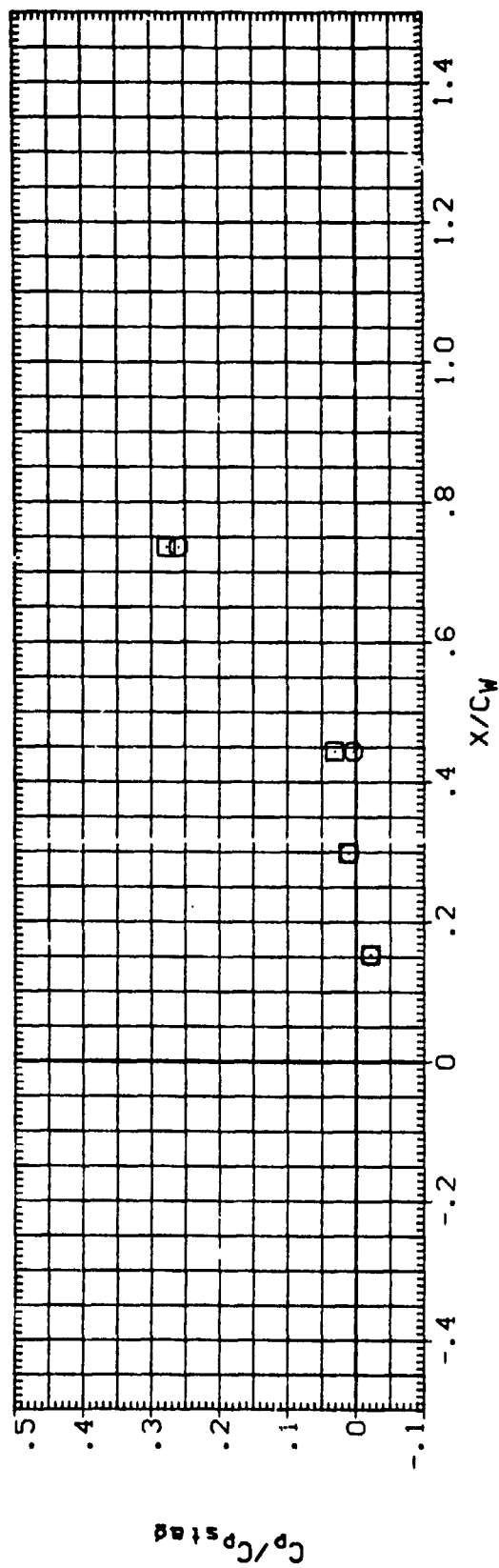


FIG. 11 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING, BETA= 0. RN/L= 1.2

(R03LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/BW MACH
 □ .000 .600 2.360
 ○ .500 .500

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

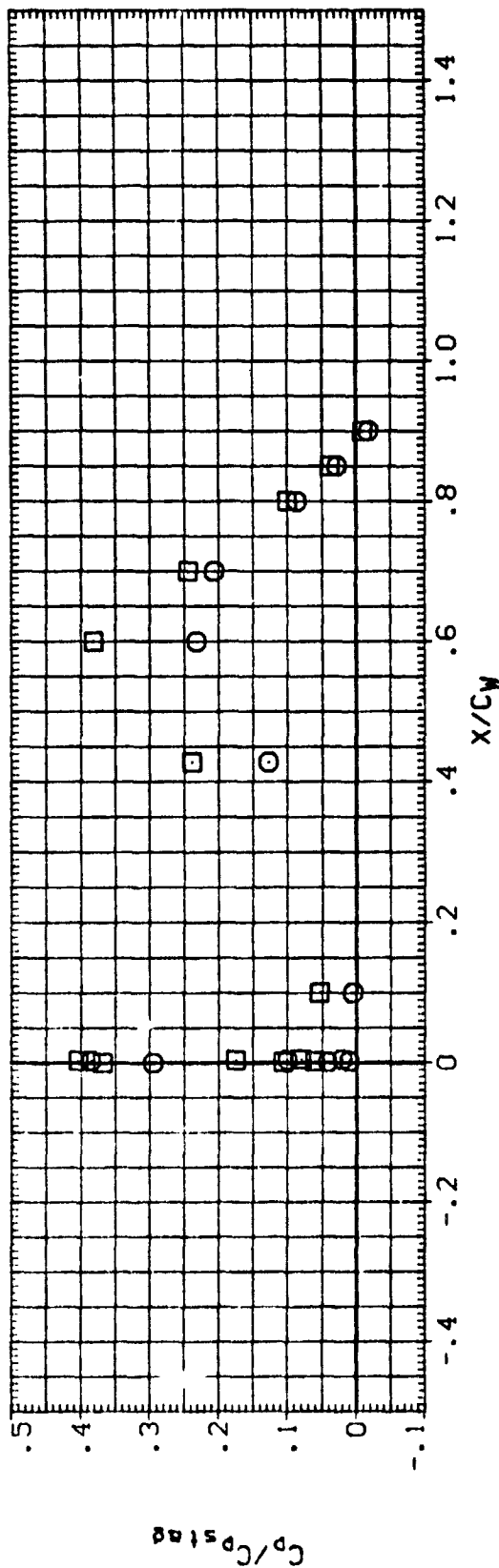
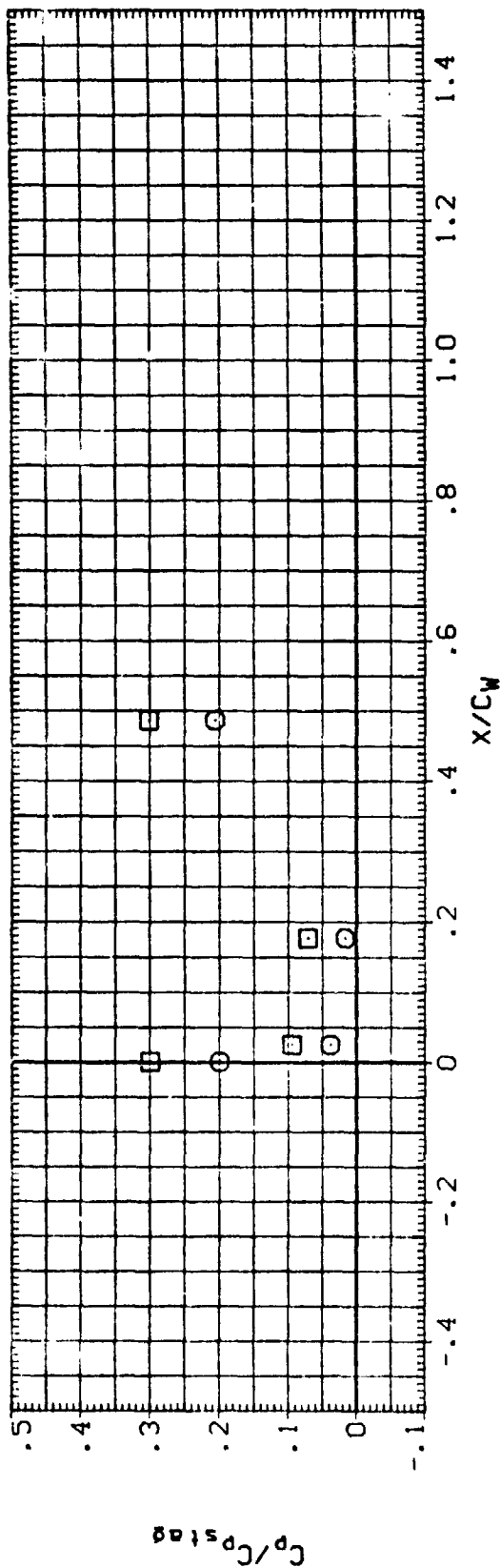


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER LOWER WING. BETA= 0. RN/L= 1.2

(RQ3LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

ALPHA .000
 SYMBOL 5.000
 2Y/BV .850
 MACH 2.360

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

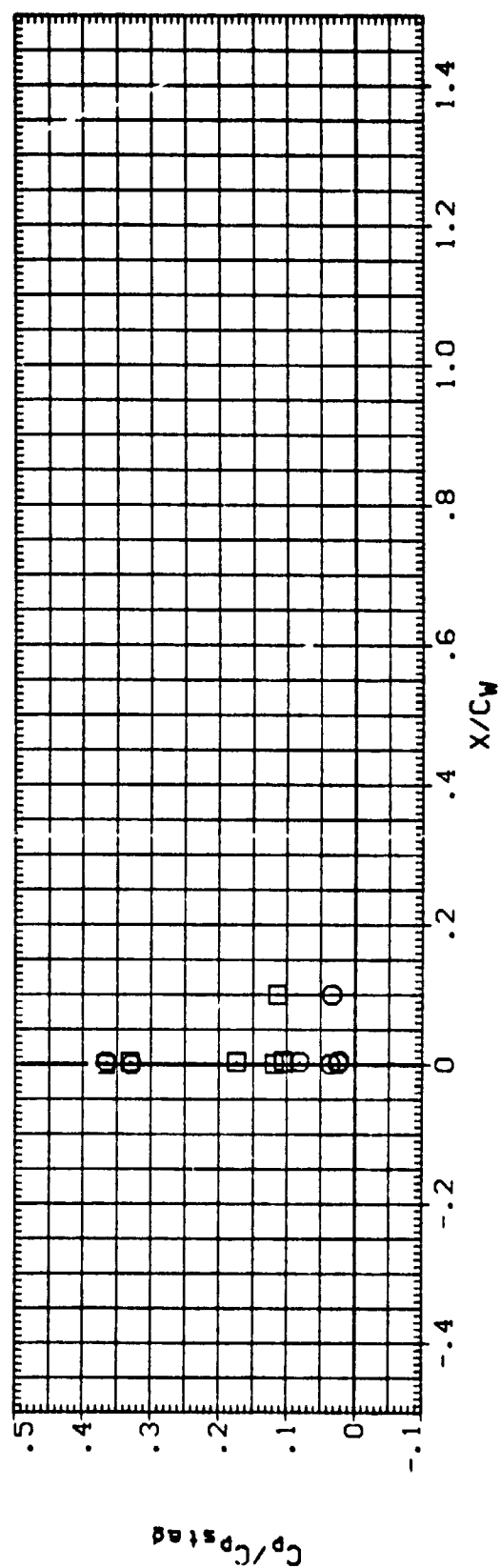
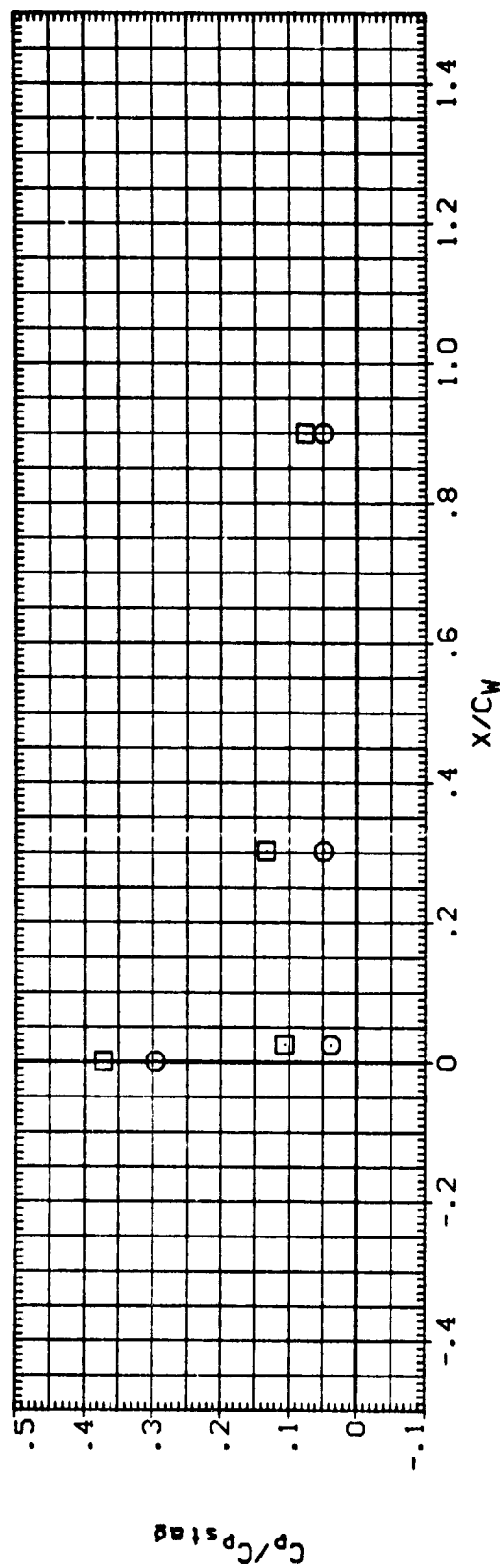


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 1.2

(R03LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/8V MACH
 5.000 .000 .400 2.950

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

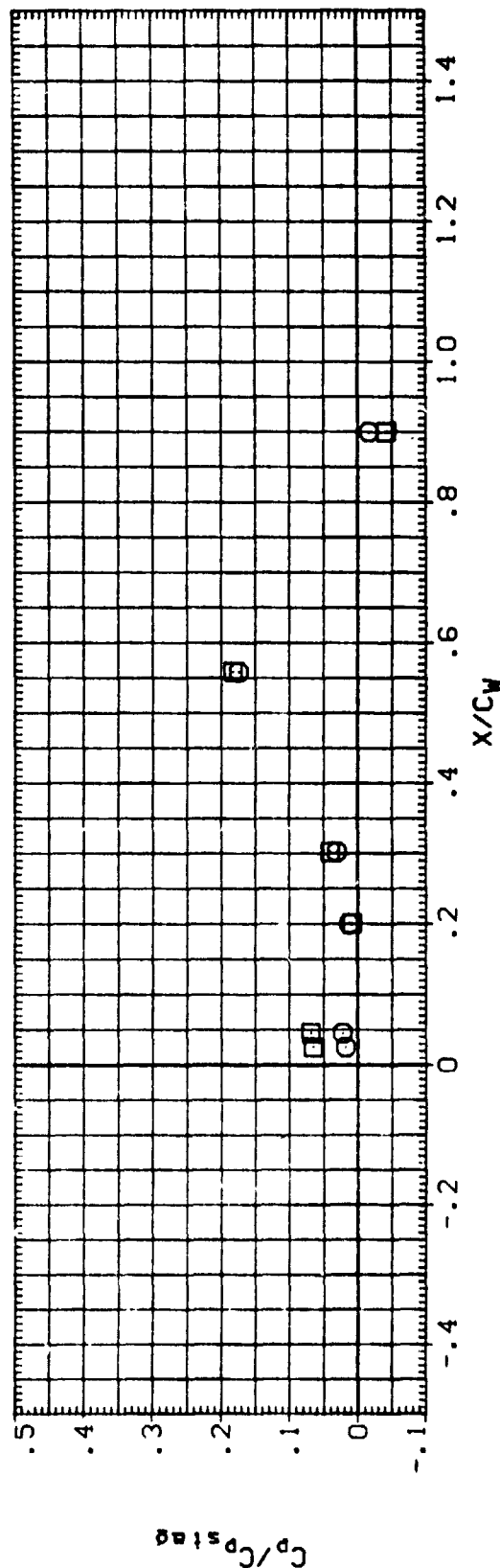
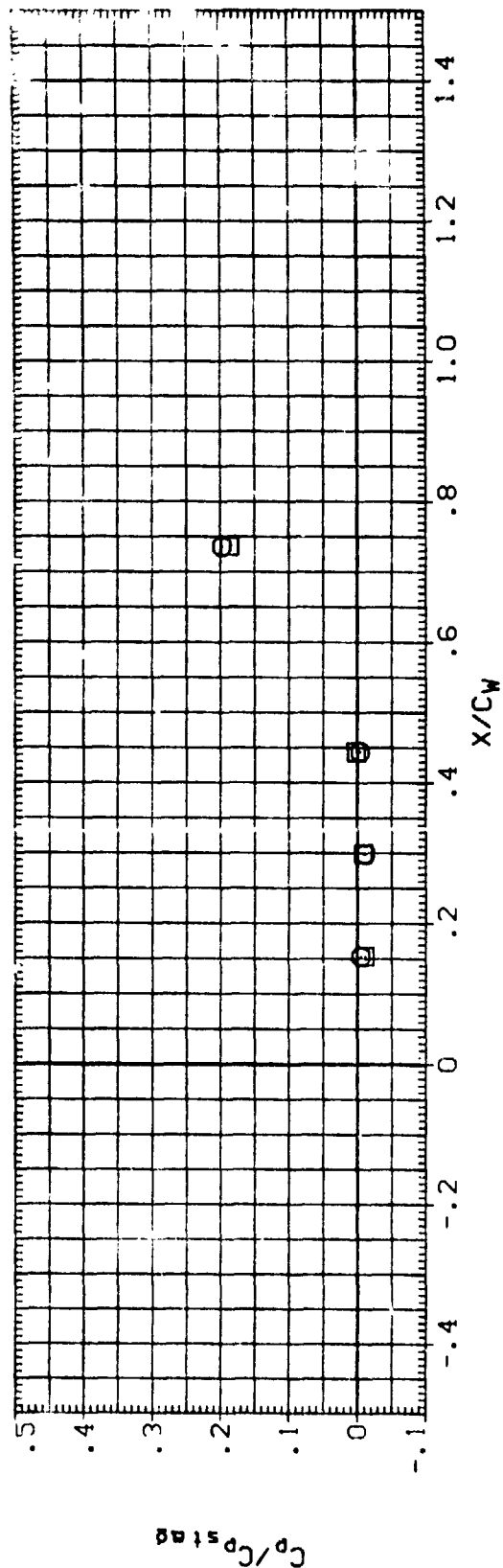


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 1.2

(R03LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2Y/8V	MACH	RN/L	PARAMETRIC VALUES
□	.000	.600	2.950		1.200 BETA .000
○	.500				

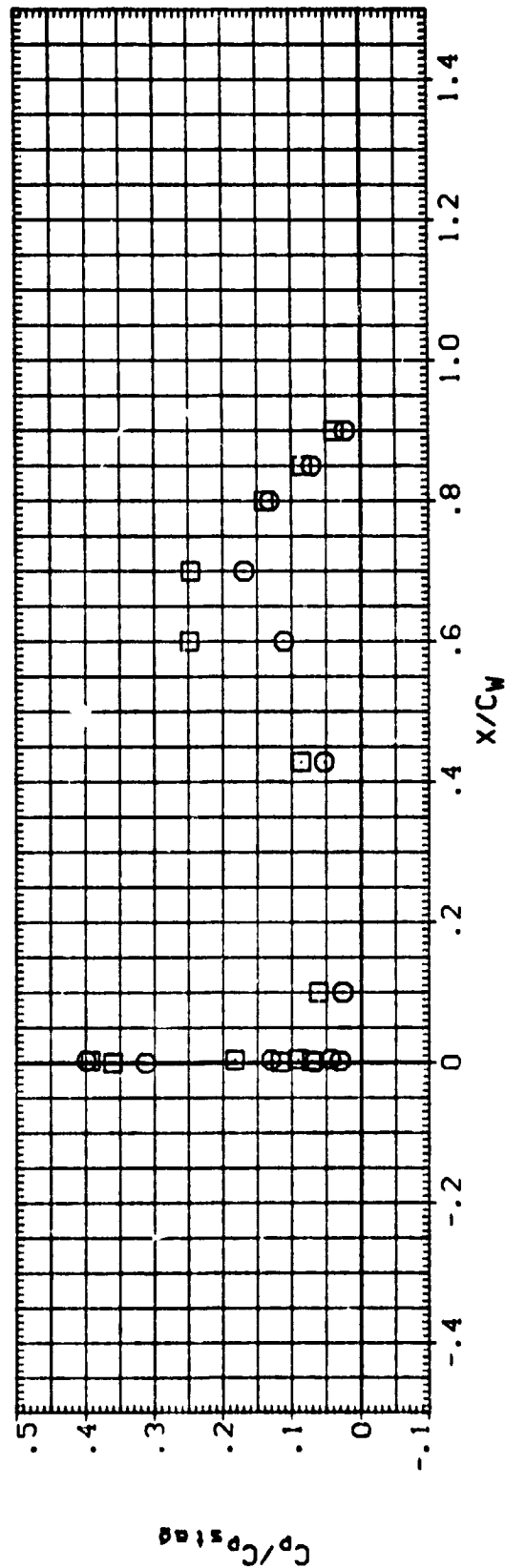
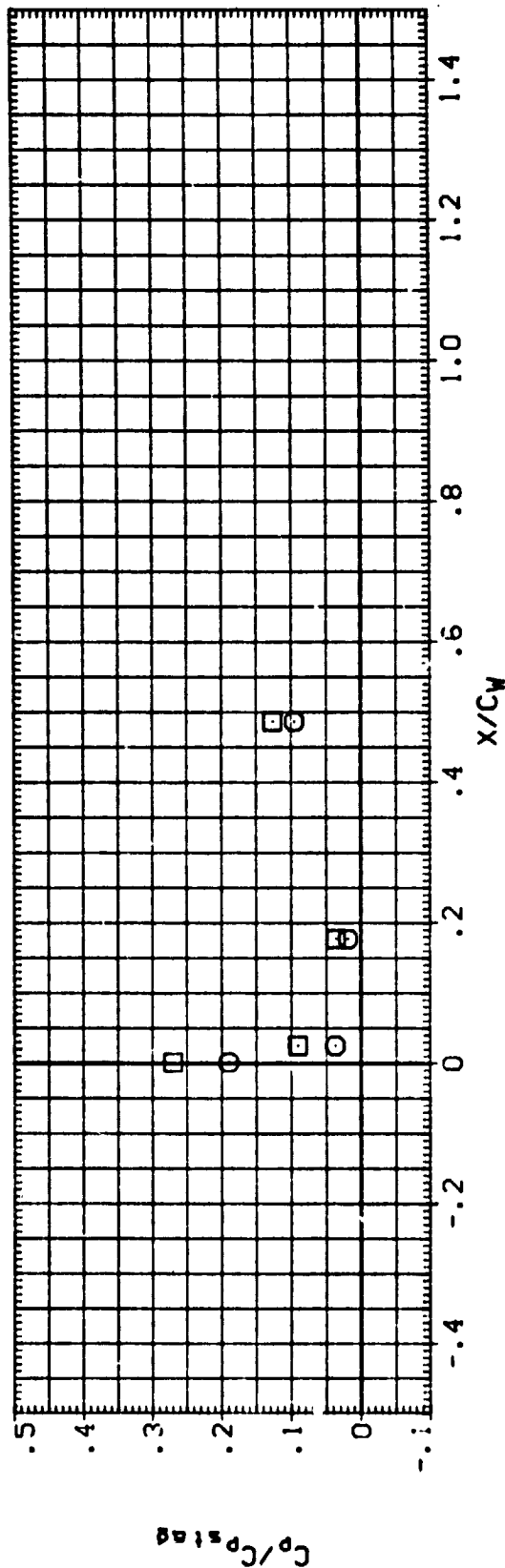


FIG. 11 VARIATION OF CP/CP0 ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 1.2

(RQ3LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA

5.000
5.000

MACH

2.950
2.950

RN/L

PARAMETRIC VALUES
1.200 BETA

.000

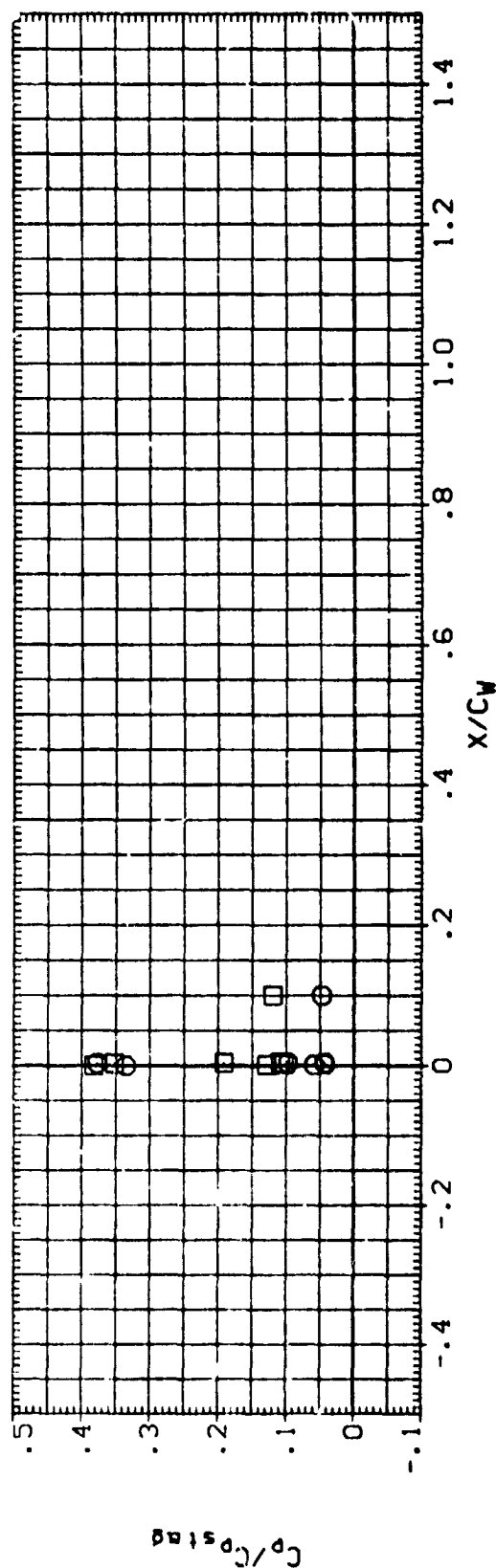
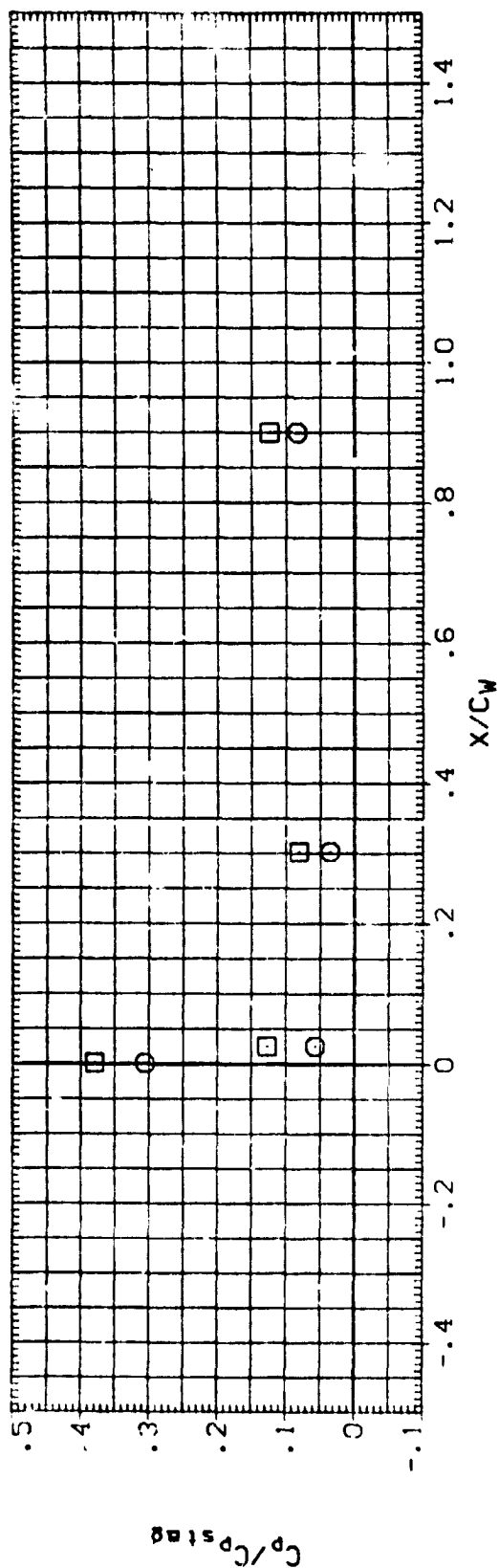


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 1.2

(RQ3LAA) UPWT 1059 (IH4) 01-T13-S8N16 ORB. LOWER WING

SYMBOL ALPHA
-5.000
.000

2Y/BV MACH
.400 3.700
.250

RM/L
1.200 BETA
.000

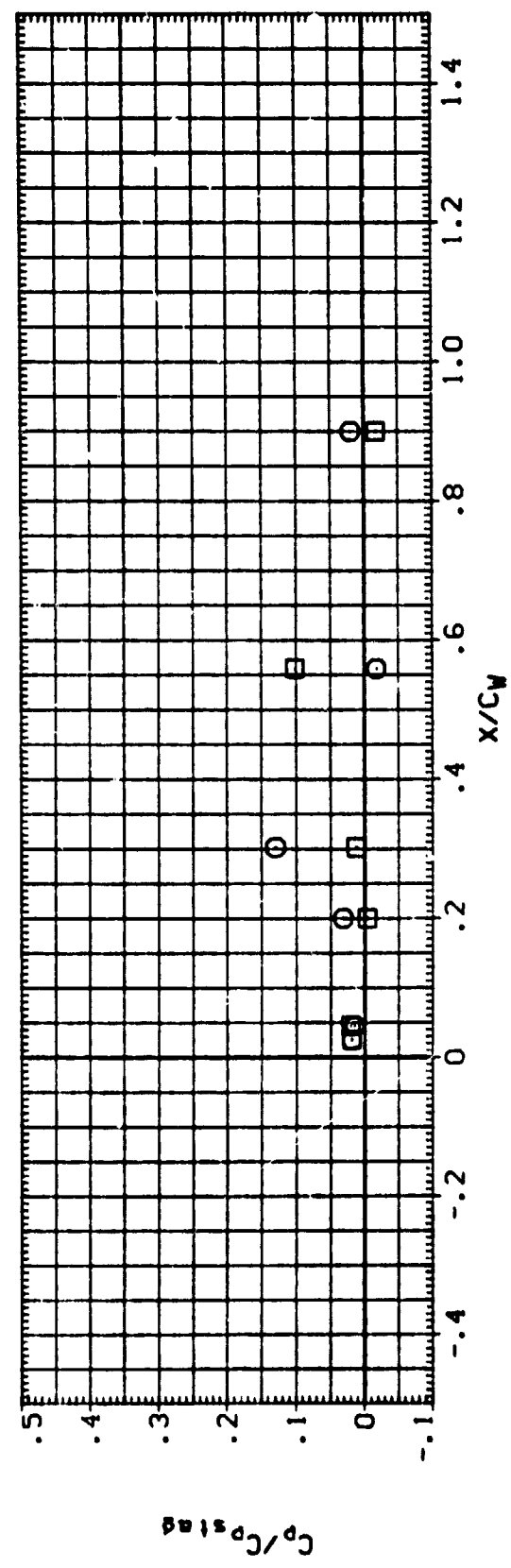
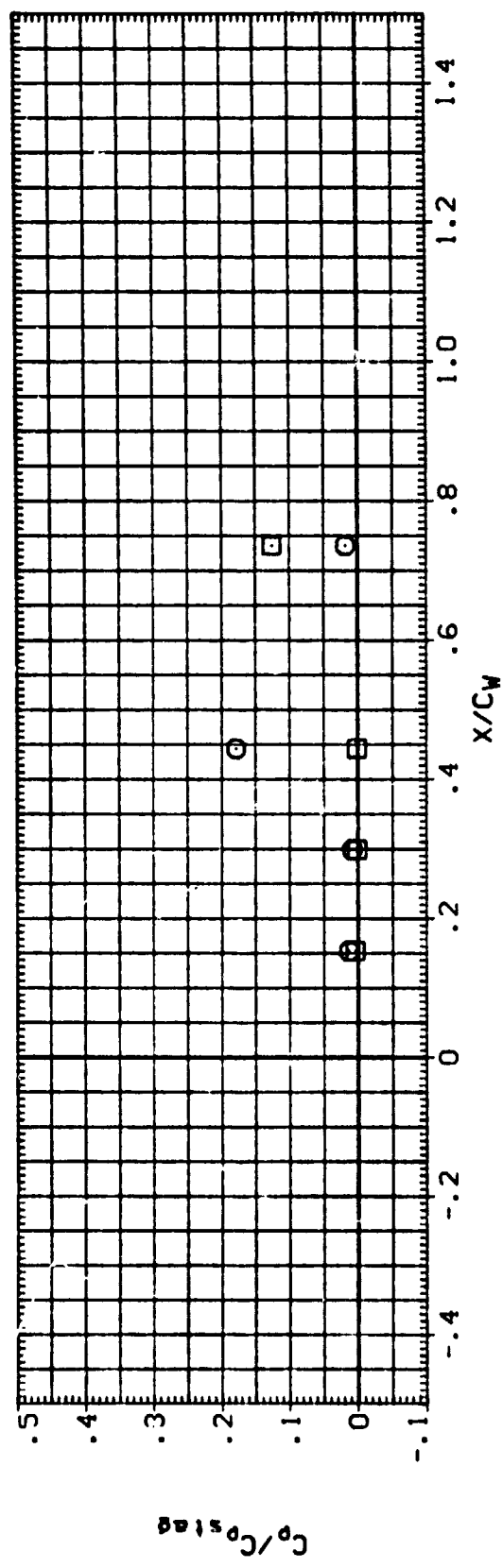


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 1.2

(R03LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

ALPHA	2°/BW	MACH	PARAMETRIC VALUES
-5.000	.600	.3.700	1.200 BETA .000
.000	.500		

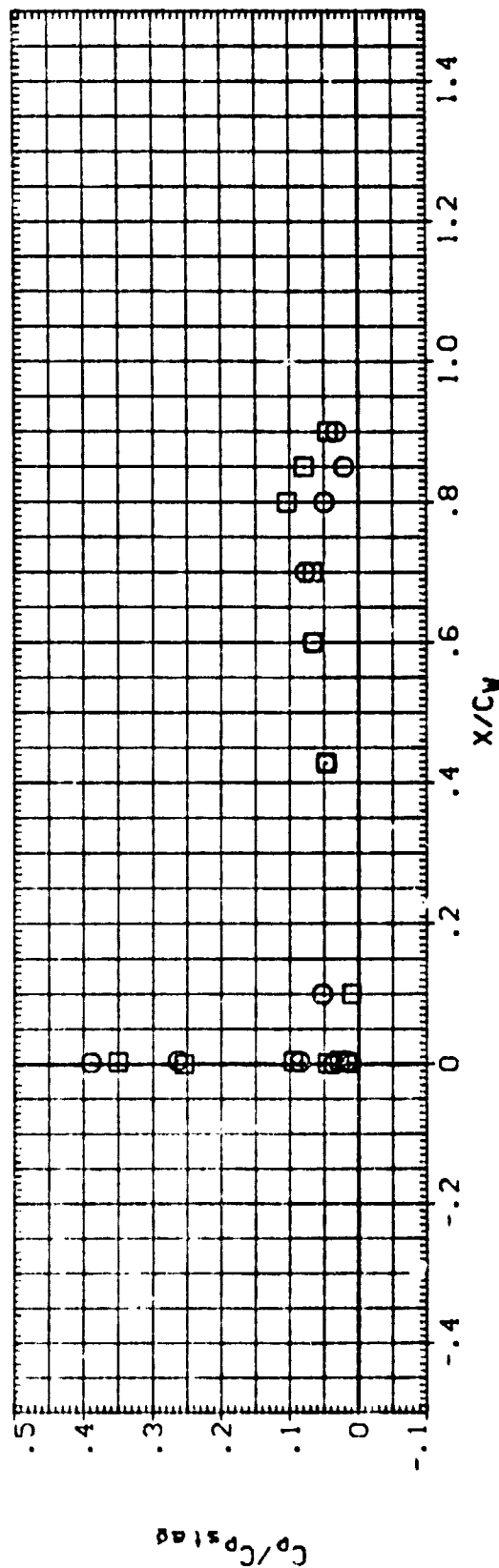
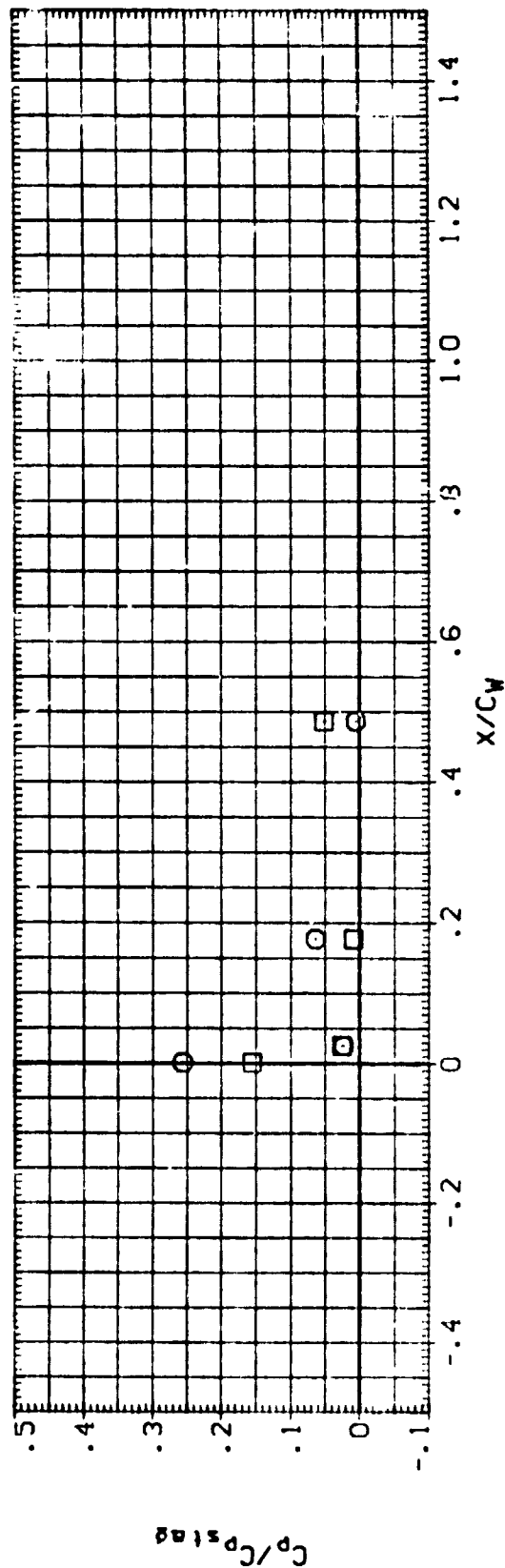


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 1.2

(R03LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2V/8V	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.850	3.700		1.200 BETA .000
□	.000	.750			

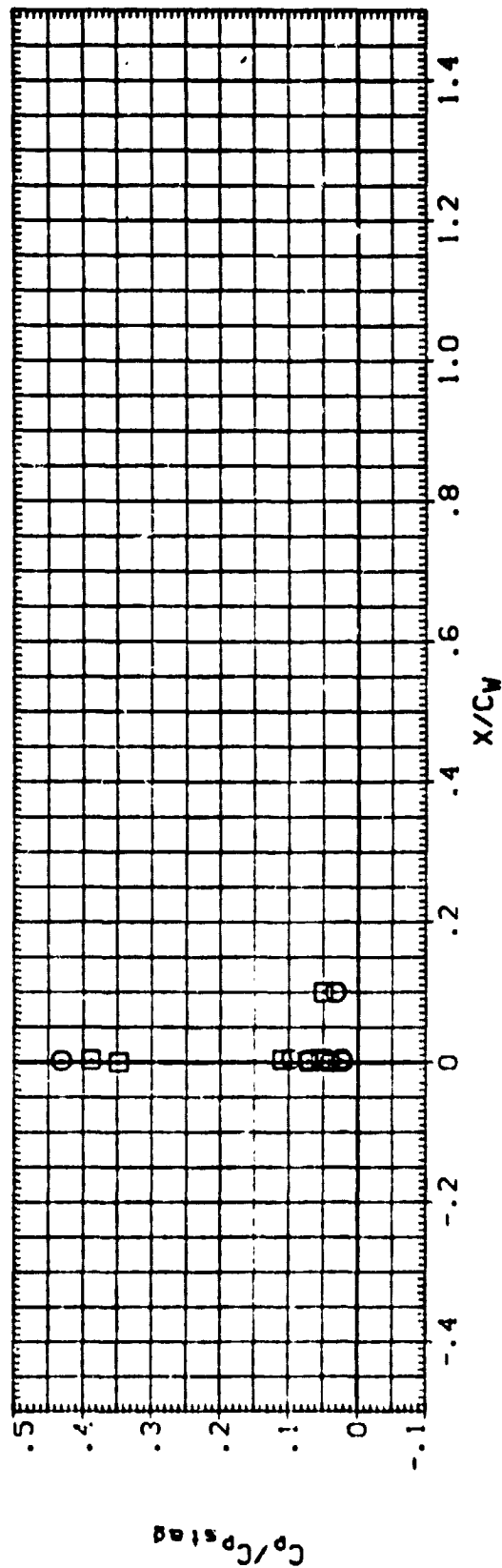
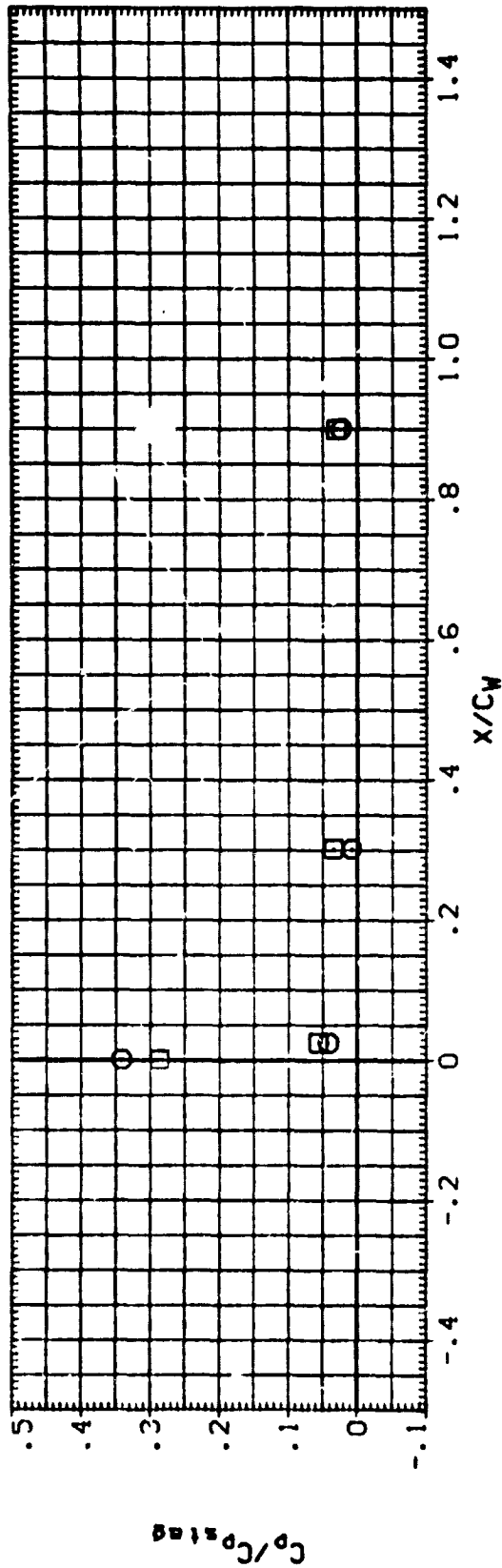


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 1.2

[R03LAA] UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPH A ZY/BV MACH
 -5.000 .400 4.600
 1.000 .250

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

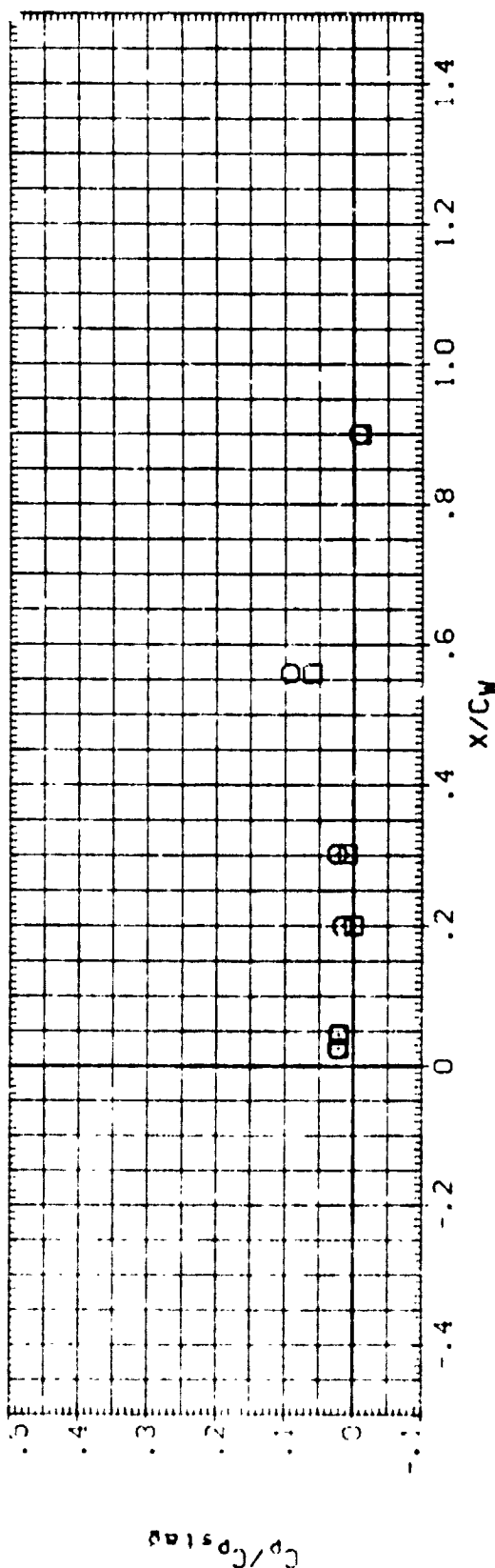
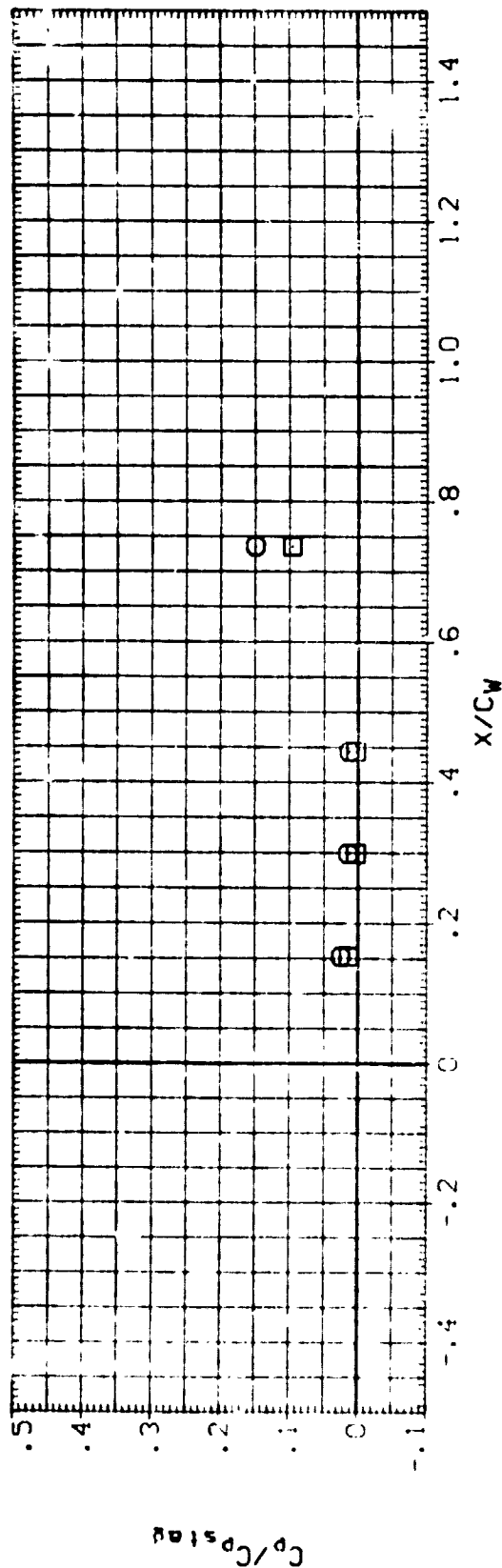


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 1.2

(R03LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

PARAMETRIC VALUES
1.200 BETA .000

RN/L

SYMBOL ALPHA
-5.000 .000
2Y/BW MACH
.600 4.000
.500

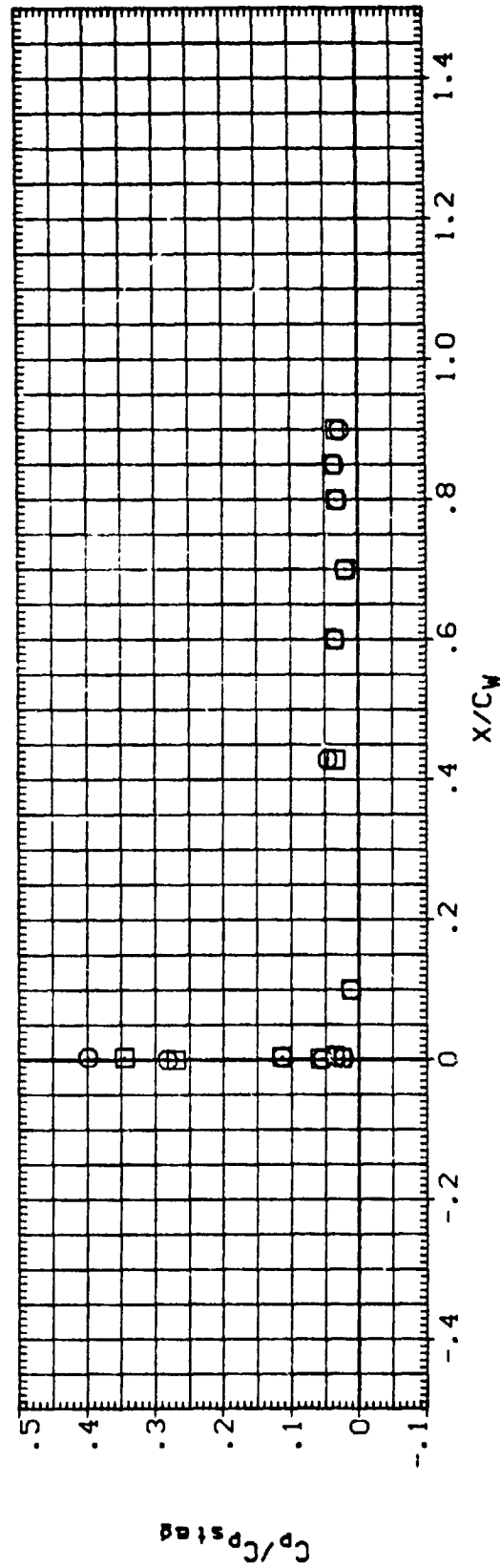
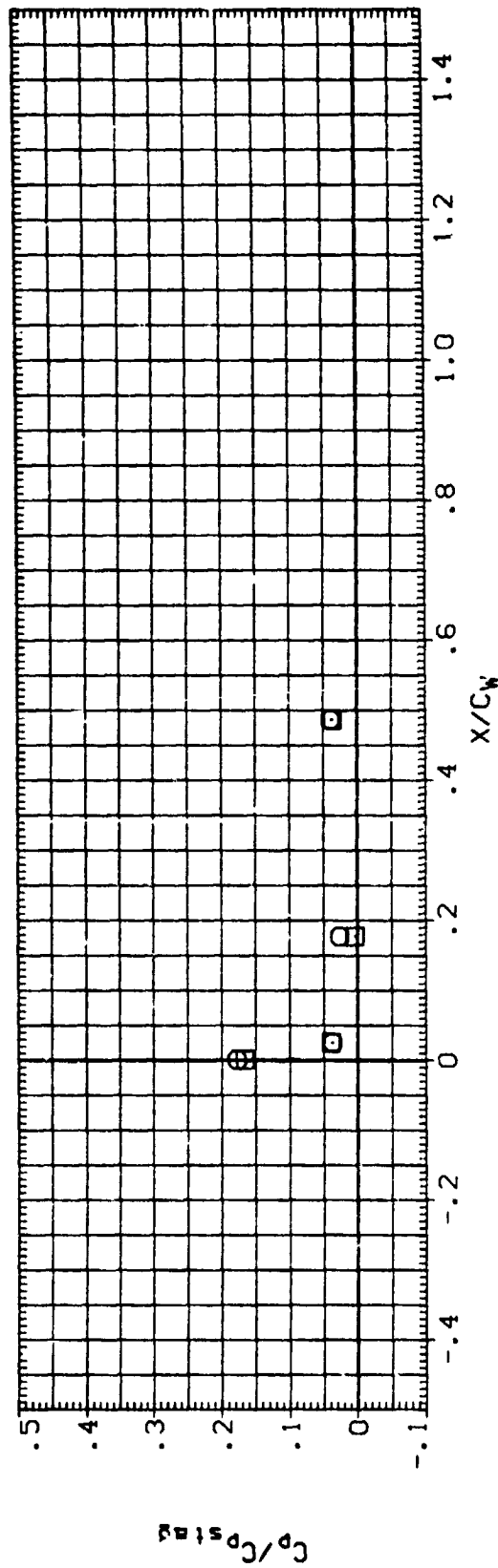


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0, RN/L= 1.2

(R03LAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/BV MACH
 -5.000 .850 4.600
 .000 .750

PARAMETRIC VALUES
 1.200 BETA .000

RN/L

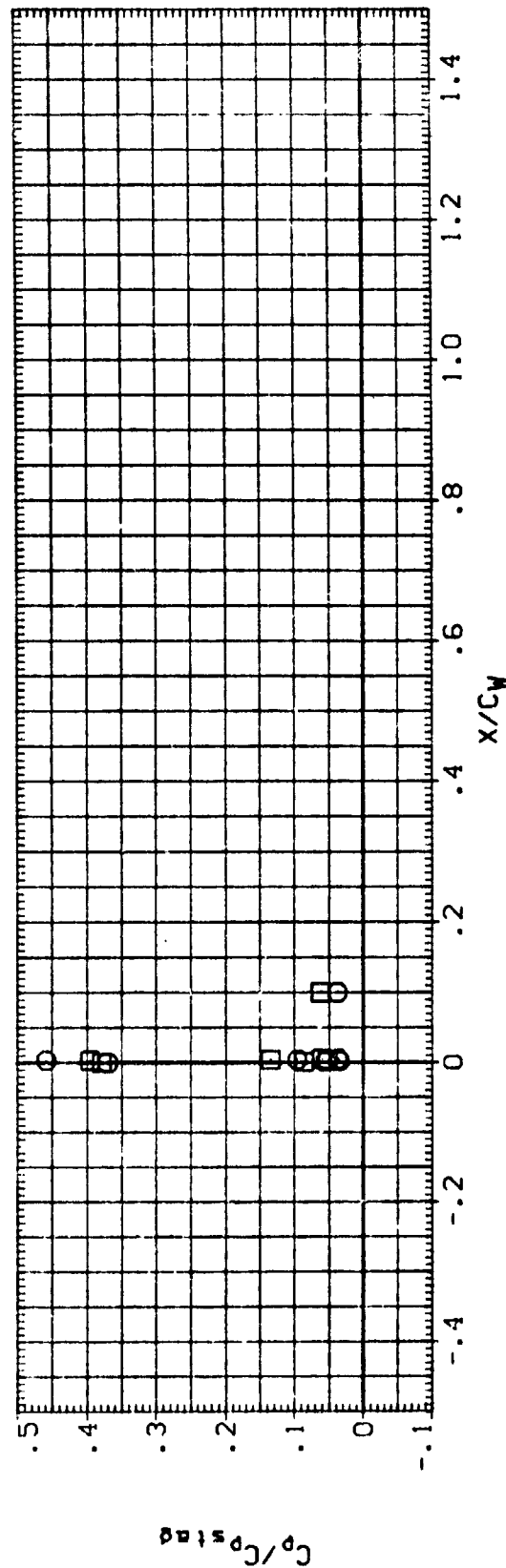
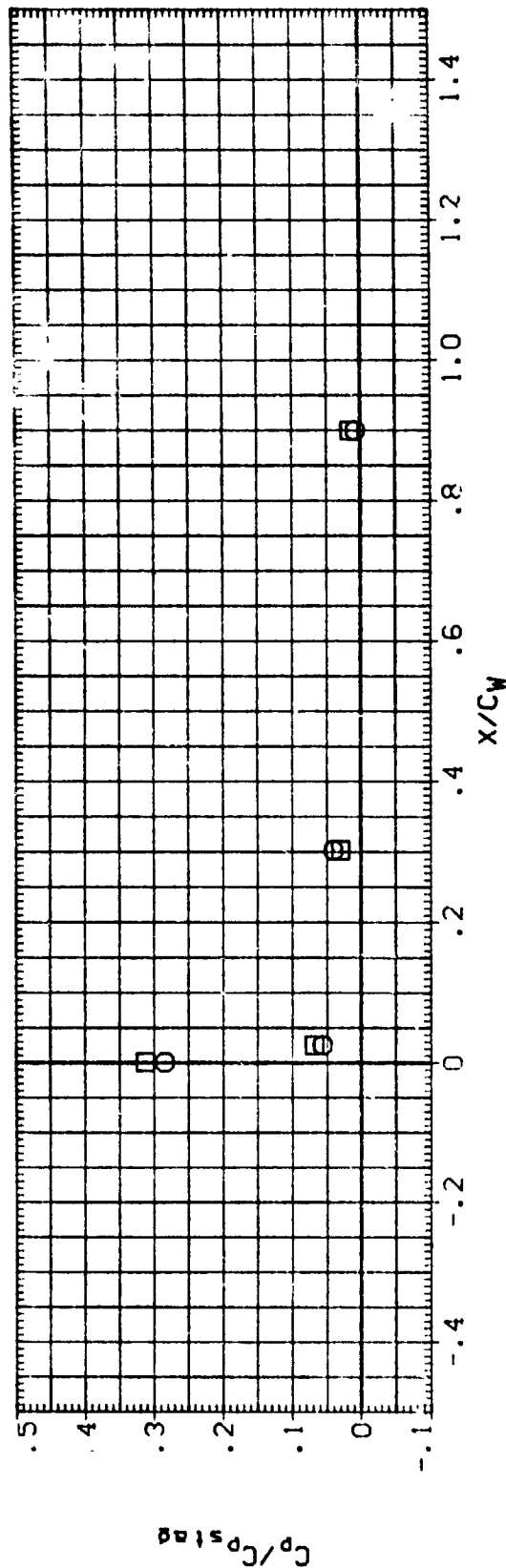


FIG. 11 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0, RN/L= 1.2

(RQ3UAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL	ALPHA	2Y/8W	MACH	RN/L	PARAMETRIC VALUES
□	.000	.800	2.360	1.200	BETA
	5.000	.600			.000
		.400			

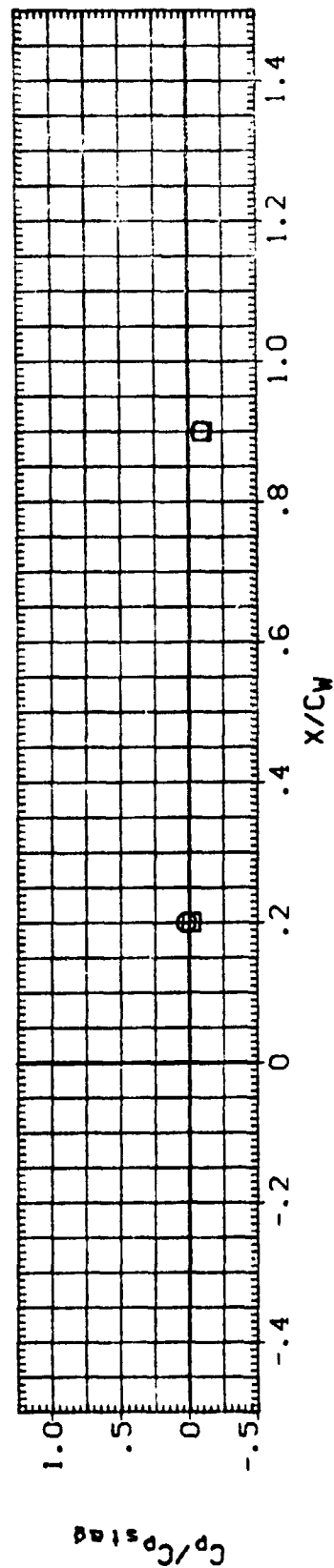
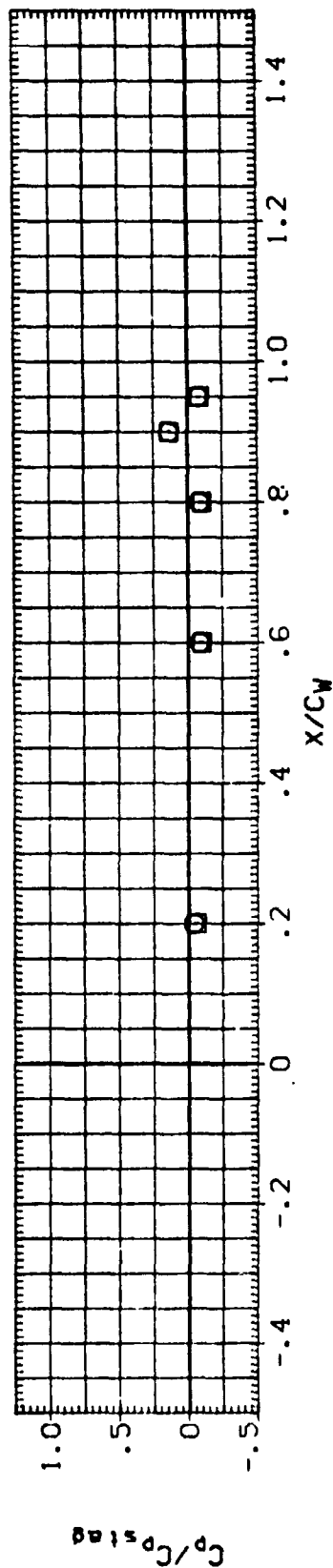
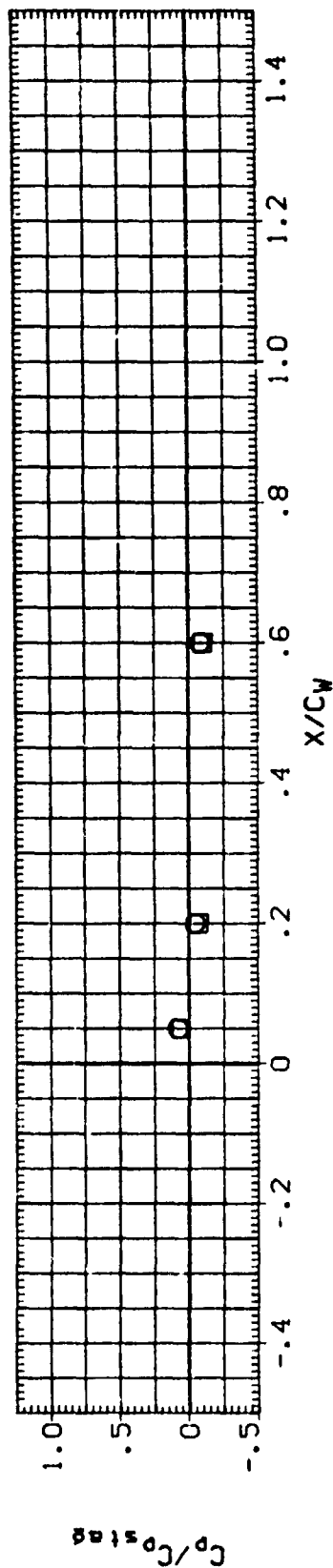


FIG. 12 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, ORBITER UPPER WING. BETA= 0, RN/L= 1.2

(R03UAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL ALPHA 2Y/8V MACH
 0 .000 .800 2.950
 5.000 .600
 .400

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

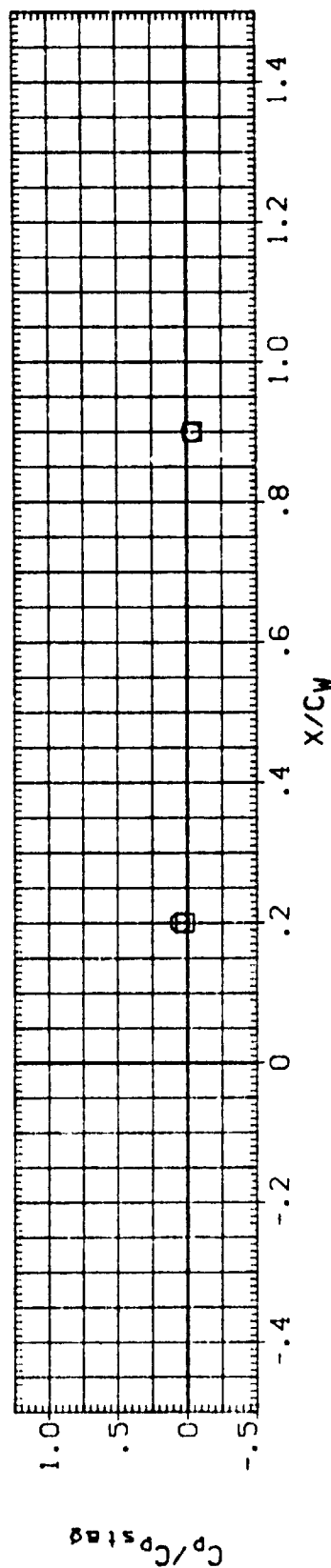
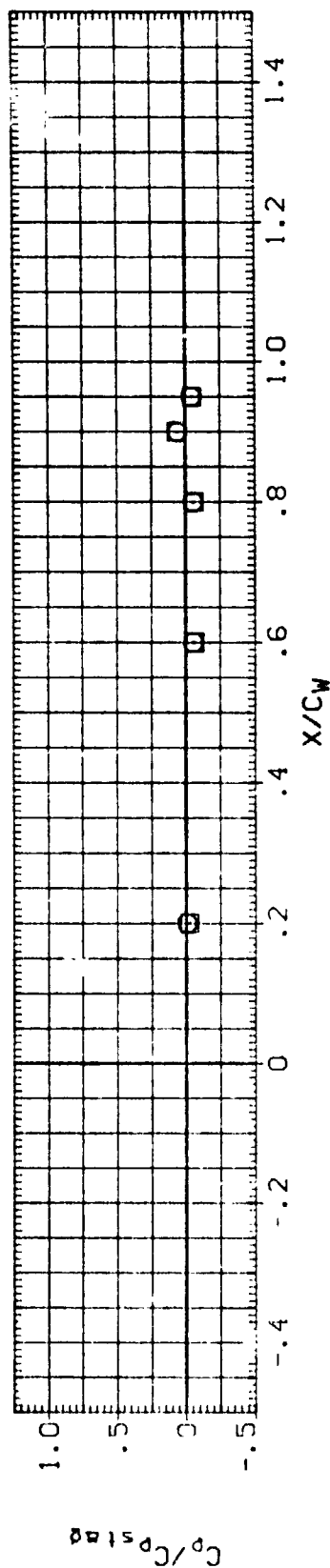
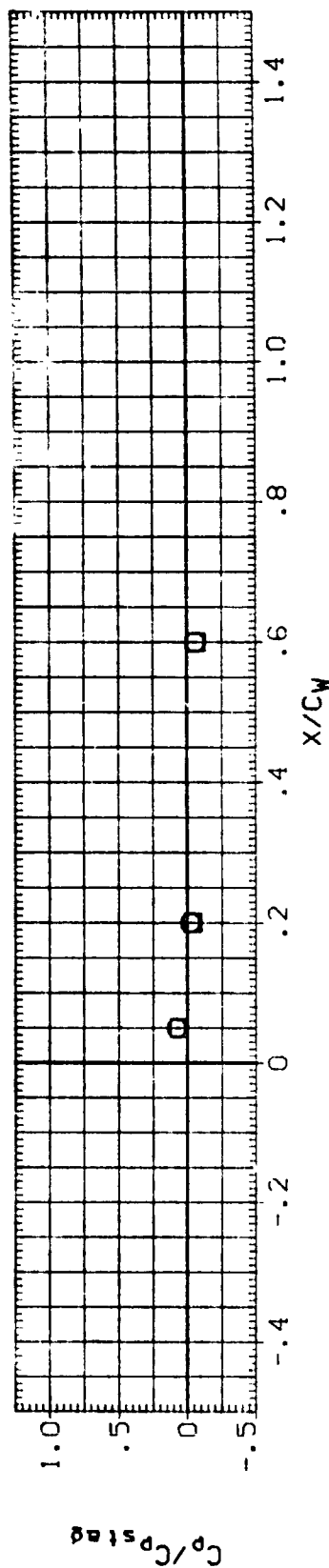


FIG. 12 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER UPPER WING. BETA= 0. RN/L= 1.2

(R03UAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL	ALPHA	2Y/BV	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.800	3.700		1.200 BETA
	.000	.600			.000
		.400			

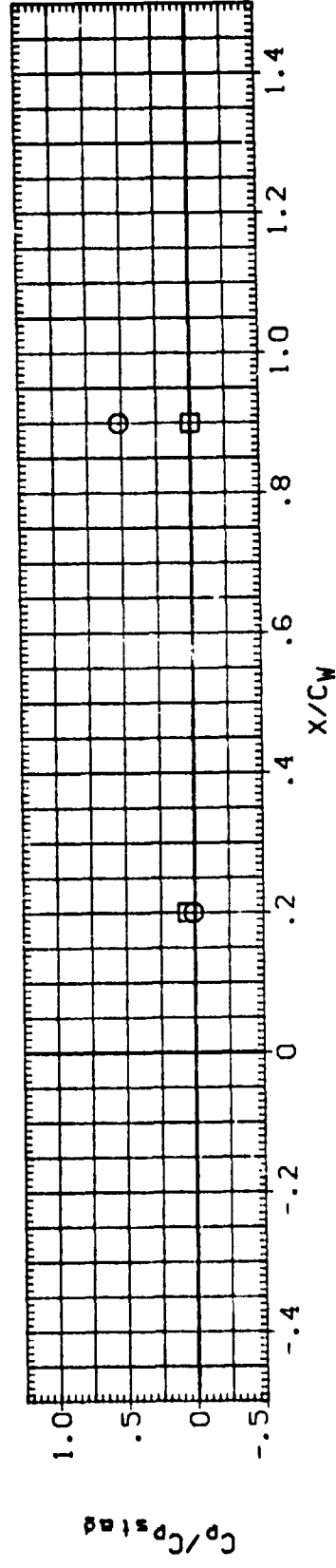
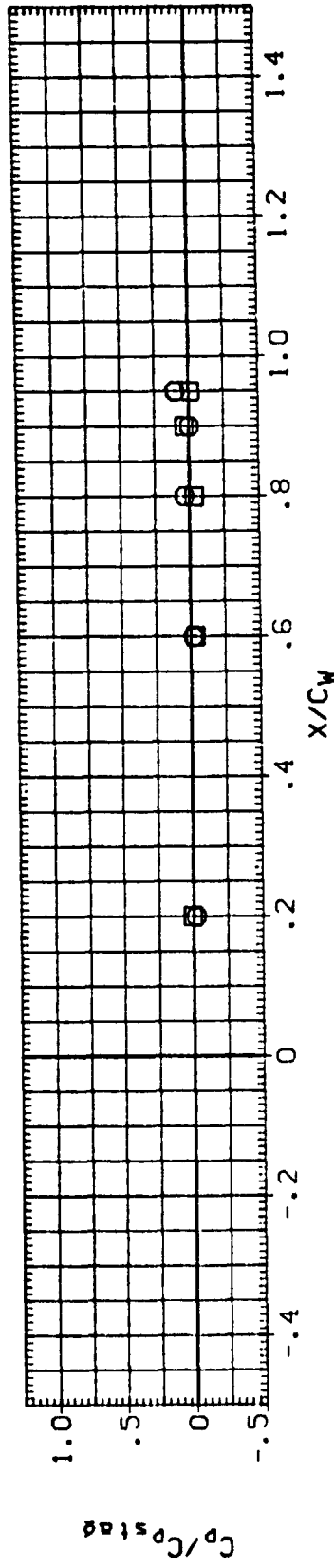
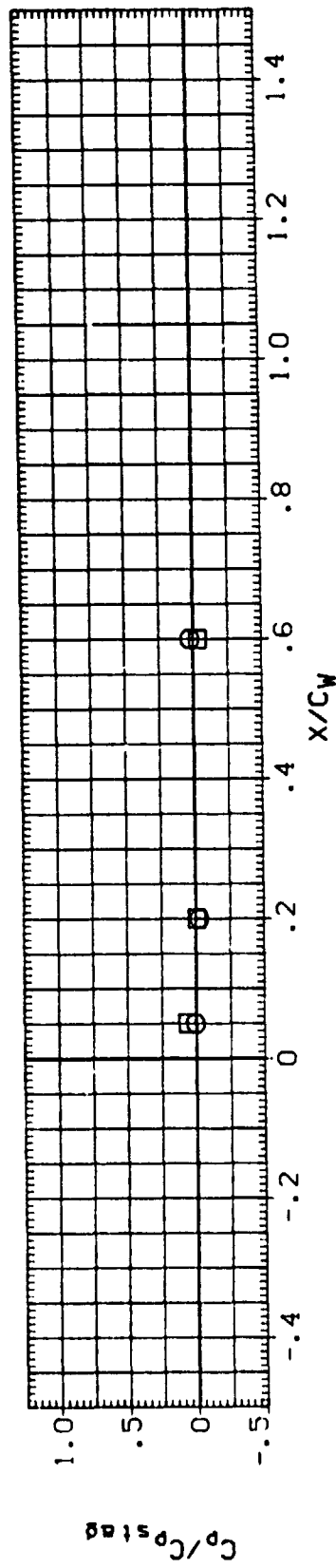


FIG. 12 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING. BETA= 0, RN/L= 1.2

[R03UAA] UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL ALPHA 2Y/BV MACH
 -5.000 .800 4.500
 .000 .600
 .400

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

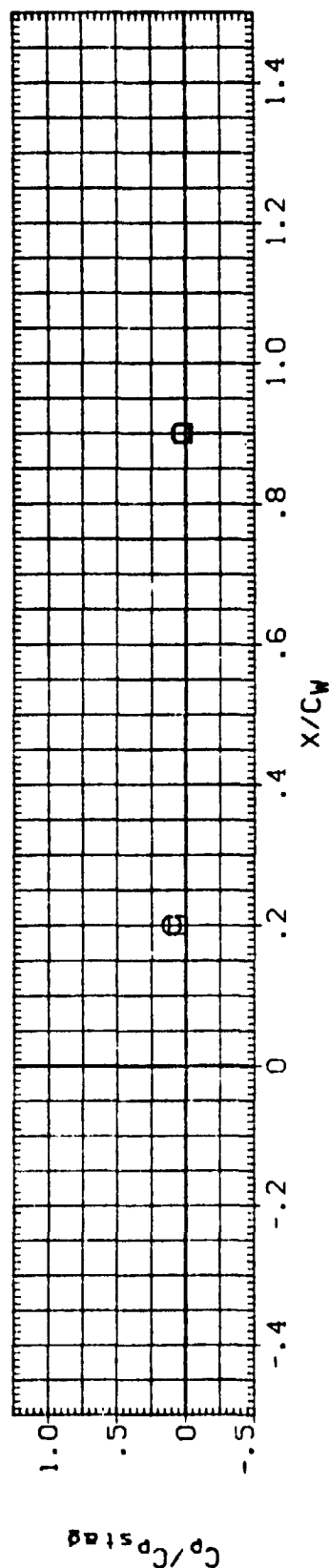
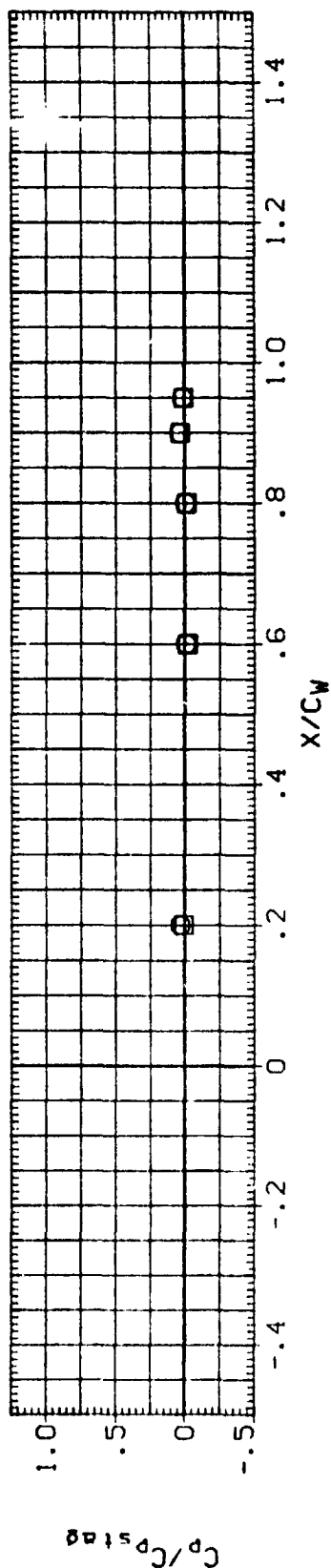
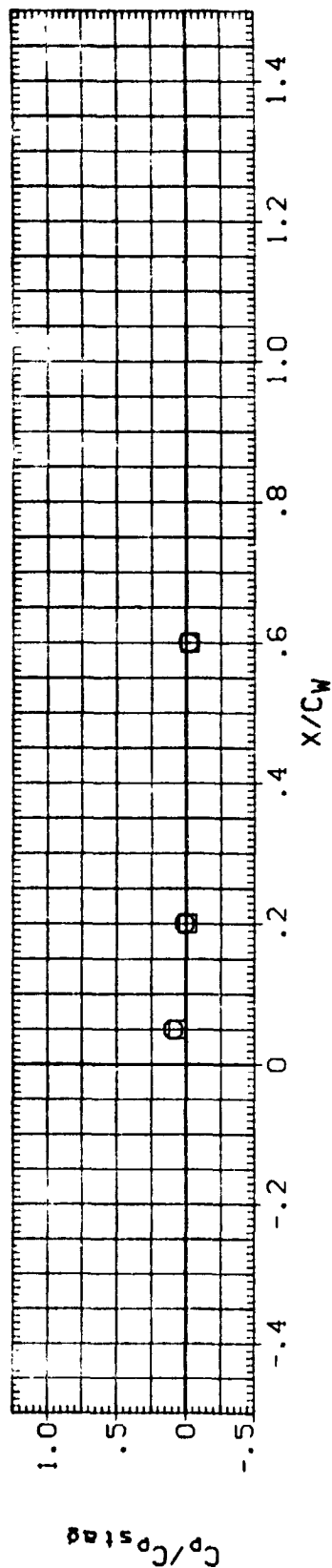


FIG. 12 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING. BETA= 0. RN/L= 1.2

(RQ3VAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL	ALPHA	Z/BV	MACH	RN/L	PARAMETRIC VALUES	BETA
□	.000	.299	2.360		1.200	.000
□	5.000	.532				
		.765				

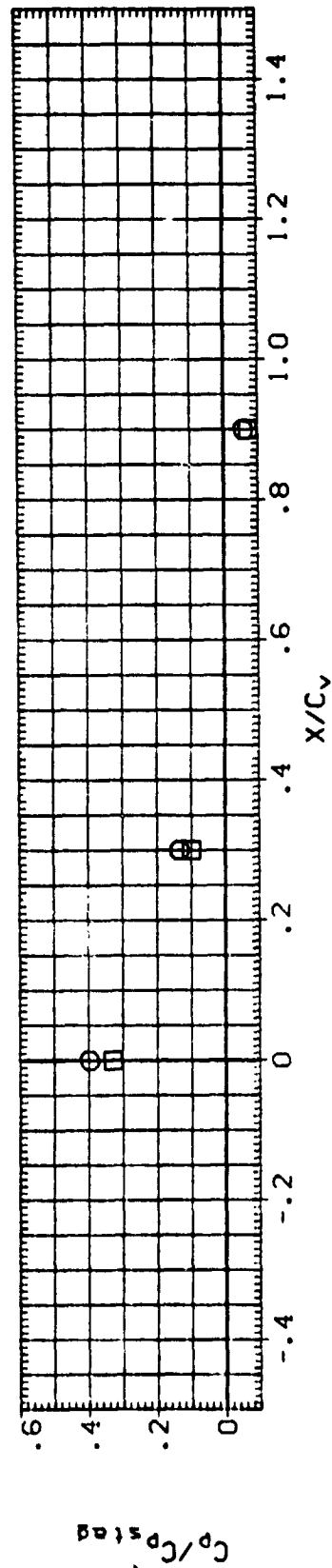
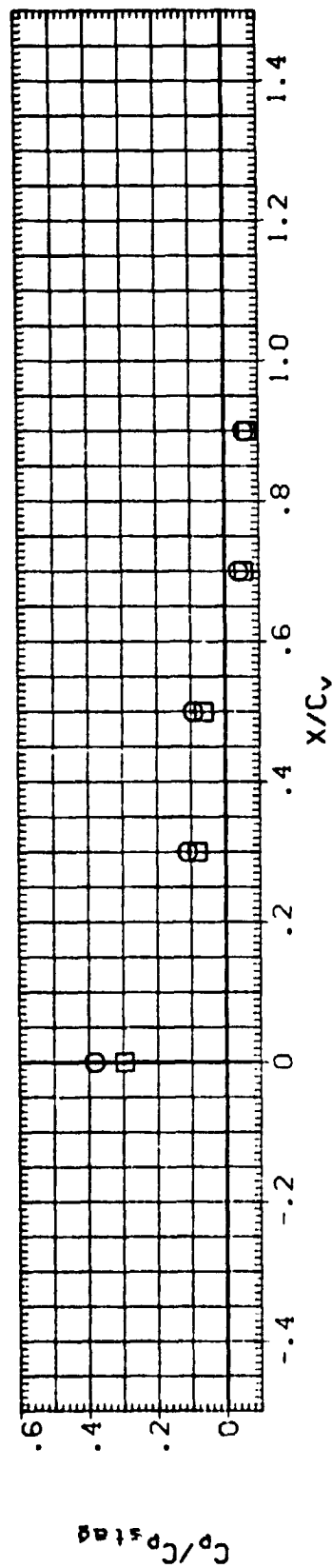
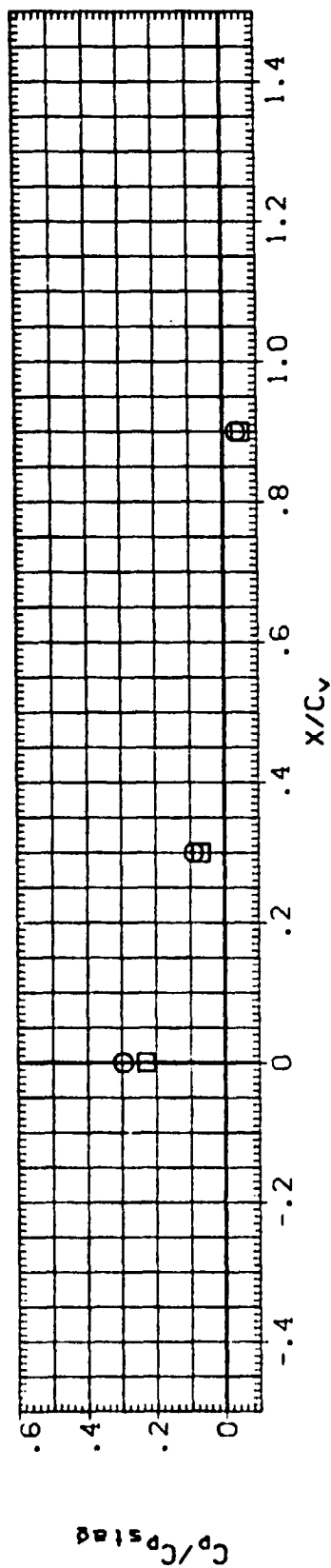



FIG. 13 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER VERTICAL TAIL. BETA= 0. RN/L= 1.2

(R03VAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL  ALPHA .000
Z/BV .299
MACH 2.950
5.000
.532
.765

PARAMETRIC VALUES
RN/L 1.200 SETA .000

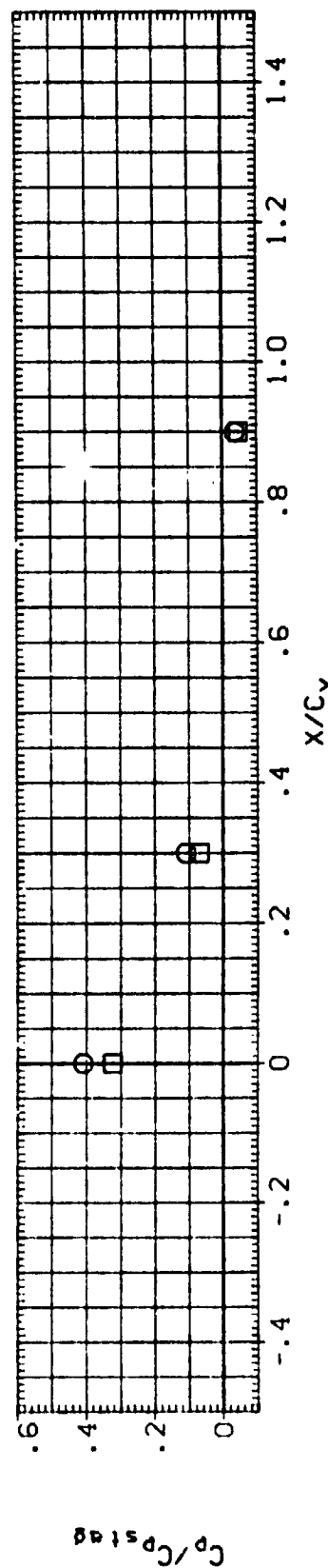
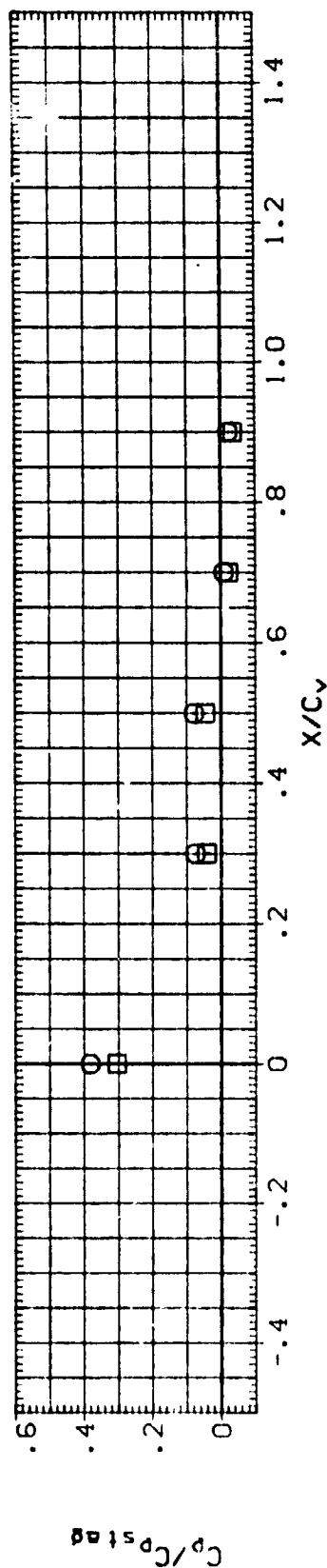
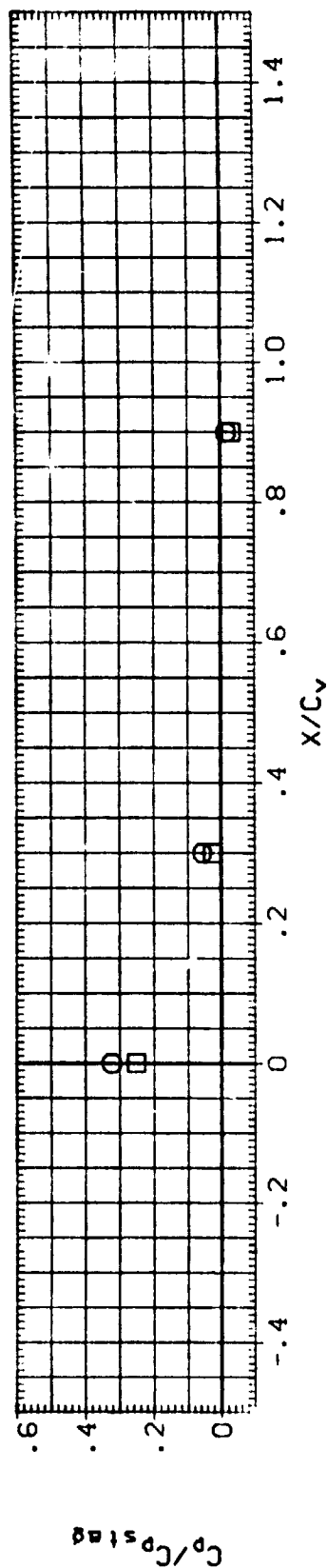


FIG. 13 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER
VERTICAL TAIL. BETA= 0, RN/L= 1.2

(R03VAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL ALPHA
-5.000
B

Z/BV MACH
.299 3.700
.532
.765

PARAMETRIC VALUES
RN/L 1.200 BETA .000

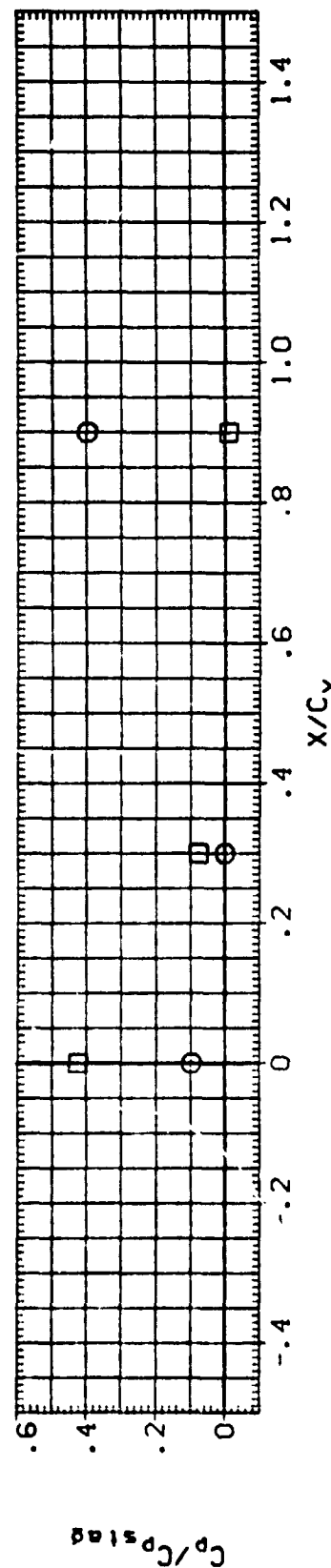
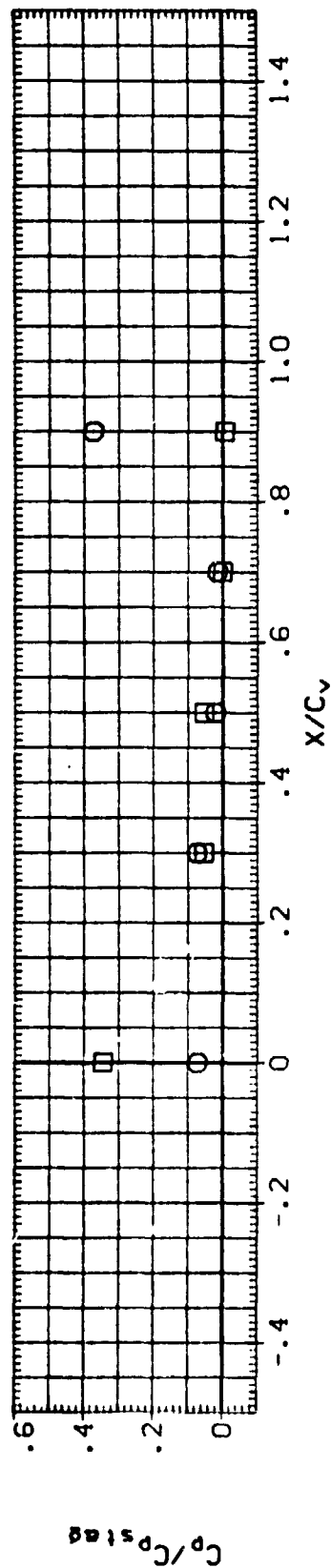
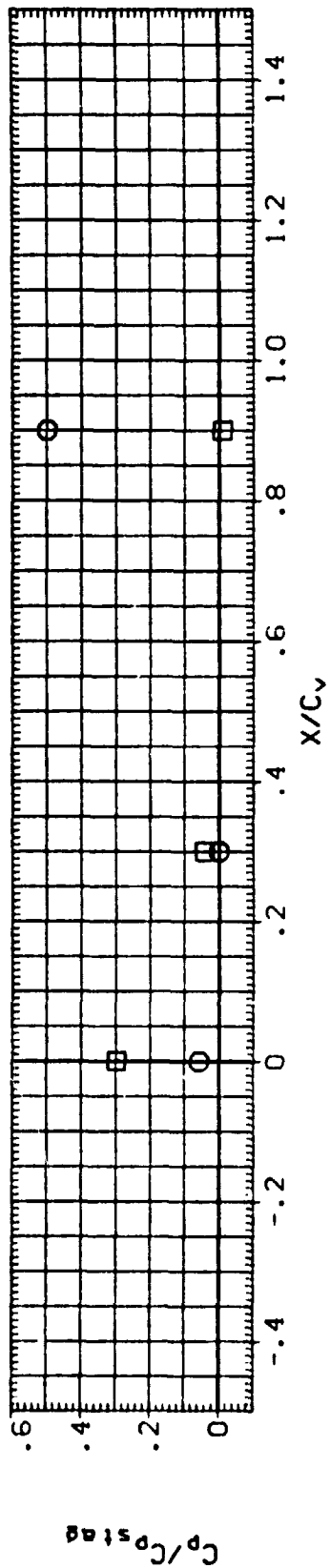


FIG. 13 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL, BETA= 0, RN/L= 1.2

(R03VAA) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL	ALPHA	Z/BV	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.299	4.600	1.200	BETA
	.000	.532			.000
		.765			

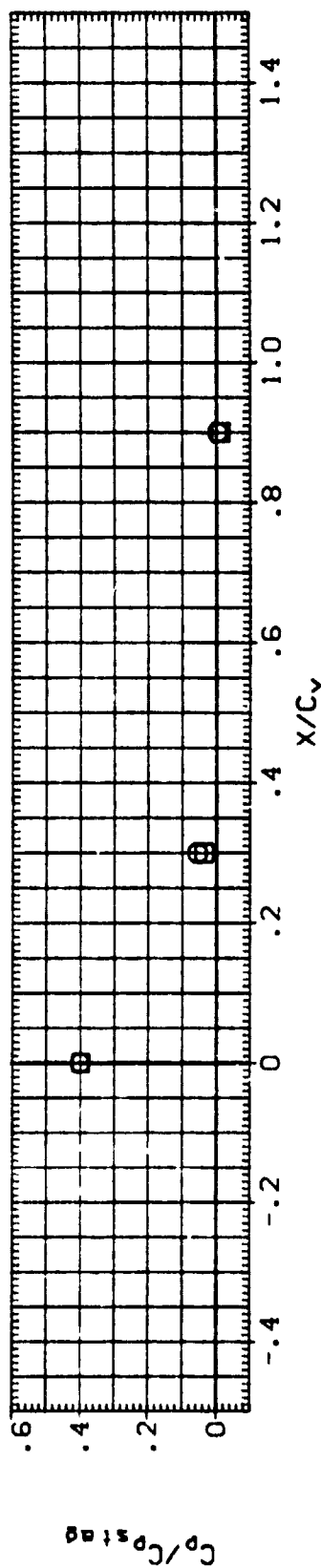
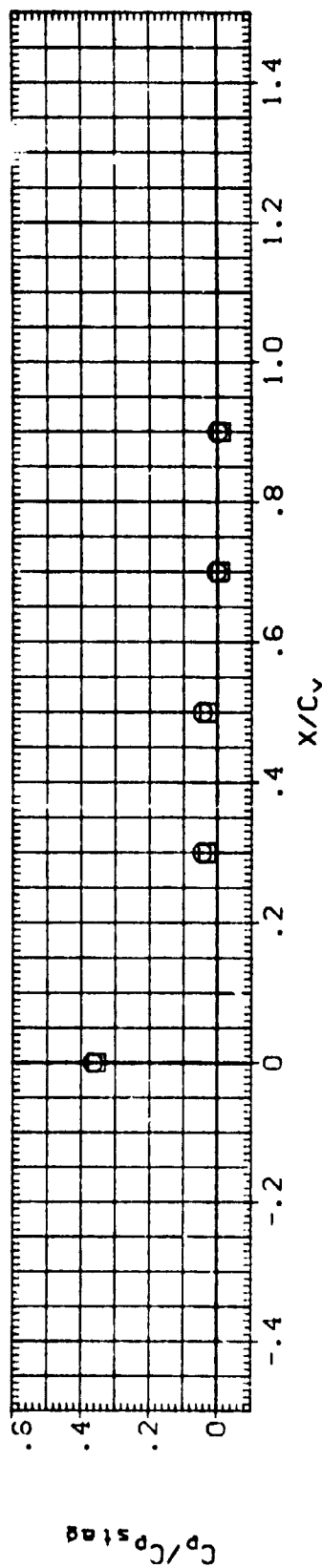
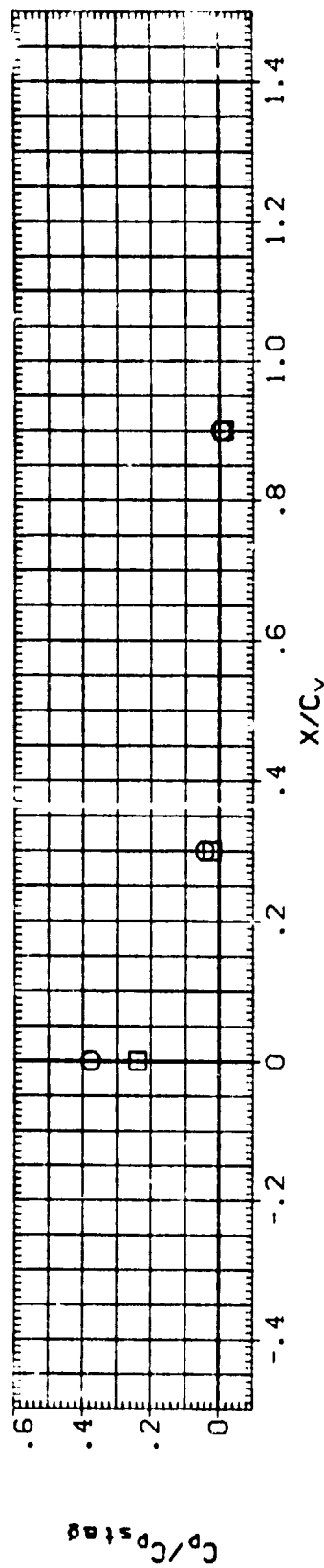


FIG. 13 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 0. RN/L= 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA .000
5.000

THETA MACH
67.500 2.360
.000

PARAMETRIC VALUES
RN/L 1.200 BETA .000

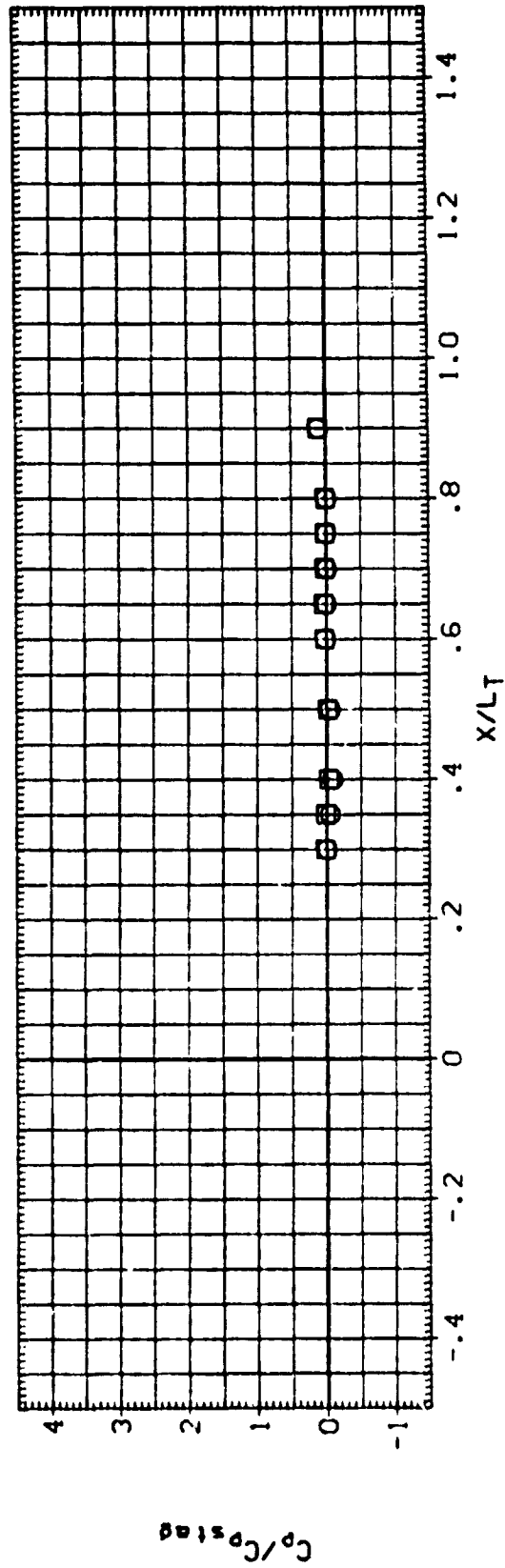
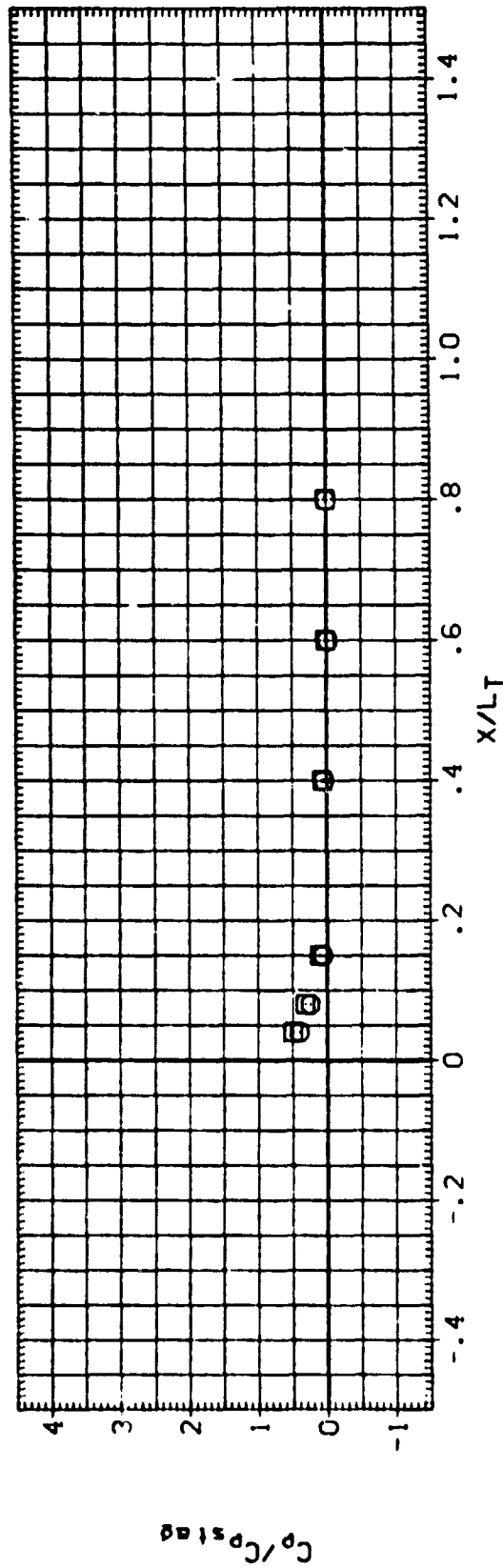


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	RN/L	PARAMETRIC VALUES	BETA	.C30
□	.000	112.500	2.360		1.200		
	5.000	90.000					

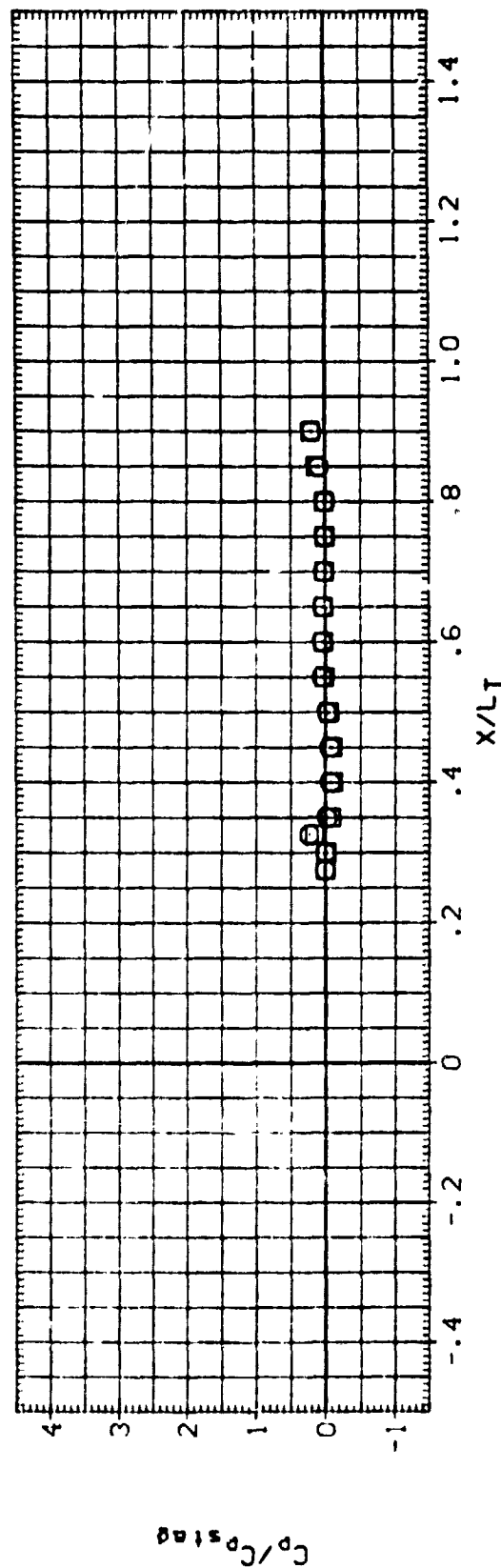
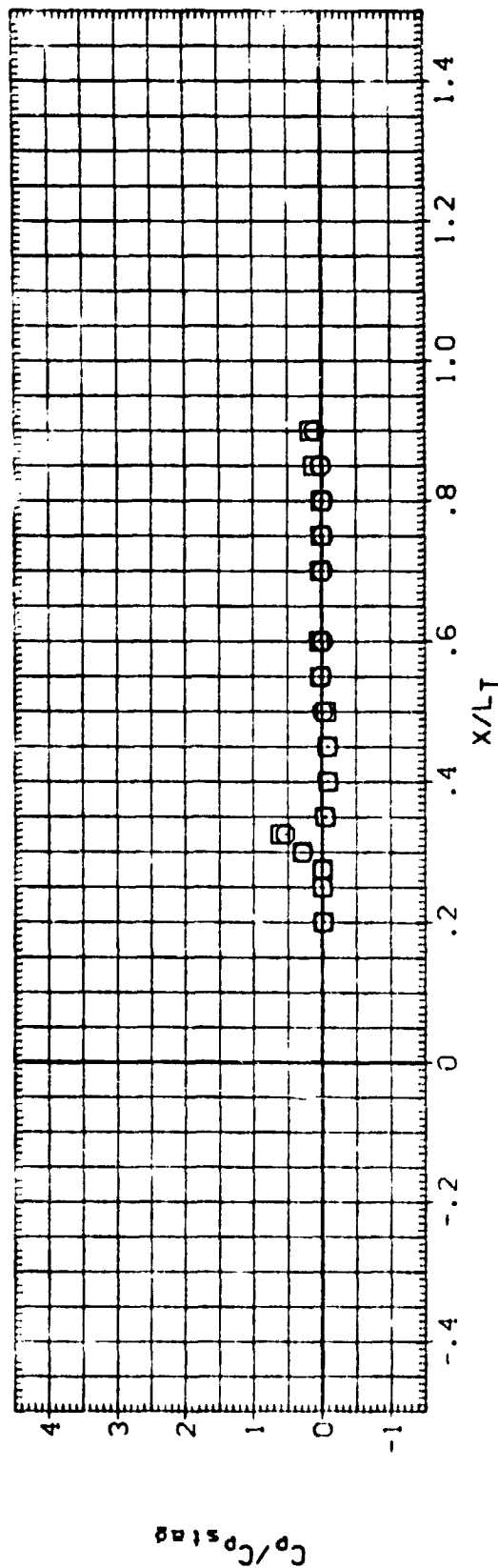


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
1.200 BETA .000

ALPHA THETA MACH
5.000 135.000 2.360

5.000 123.000

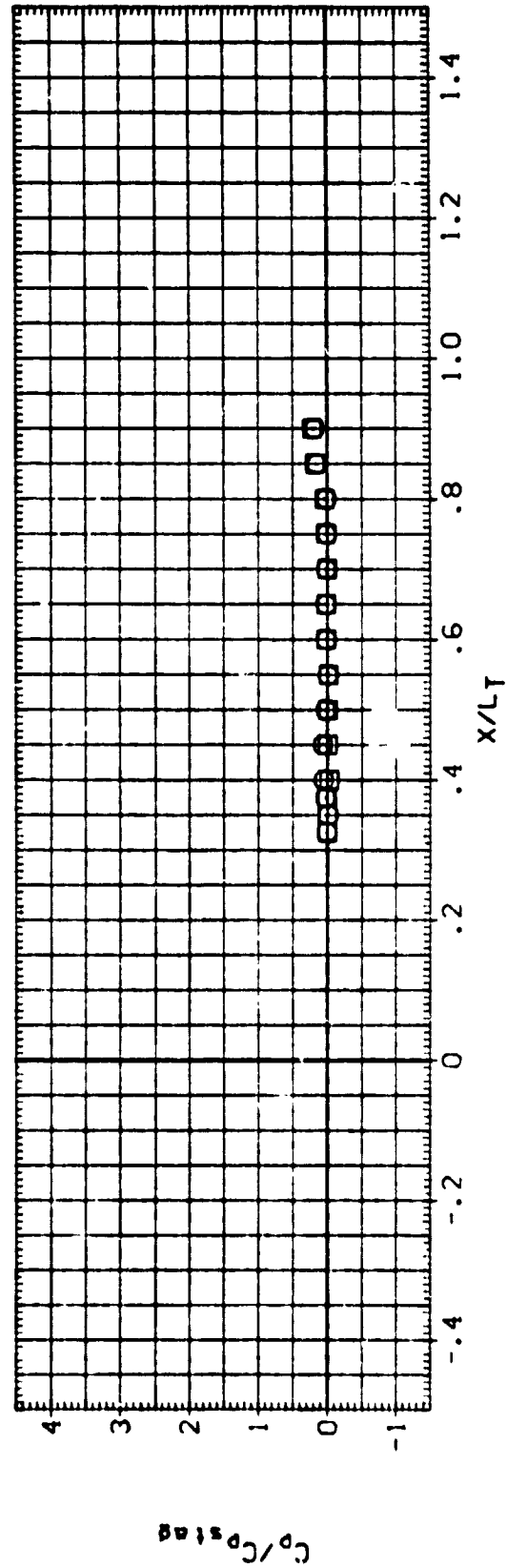
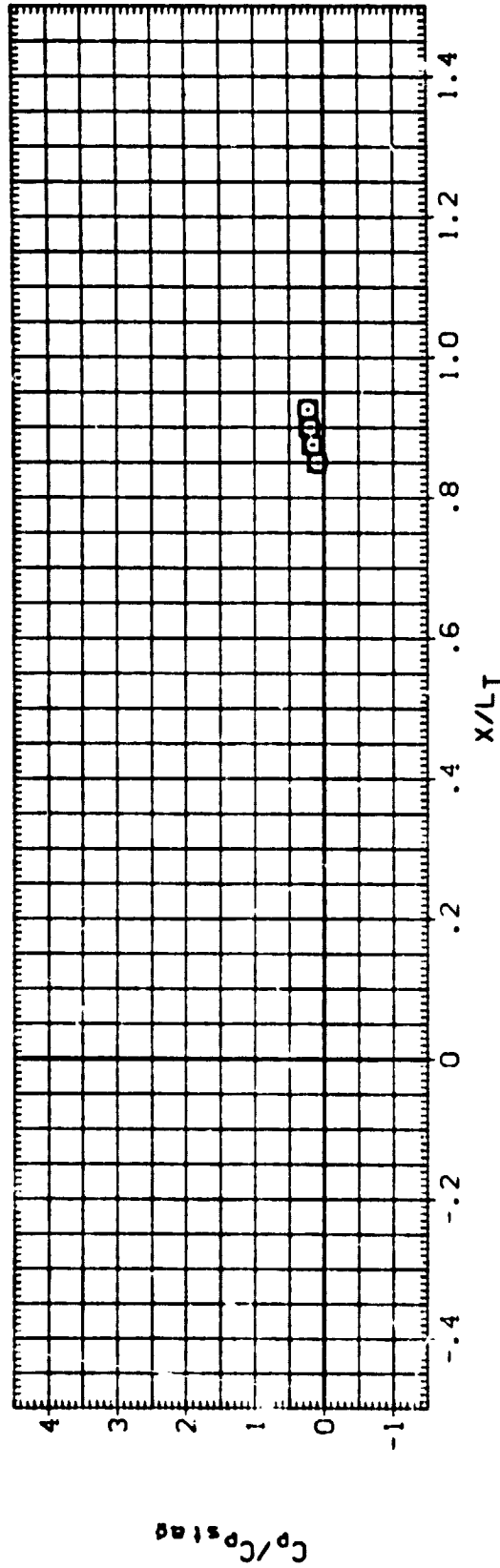


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 0.000 180.000 2.360
 5.000 157.500

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

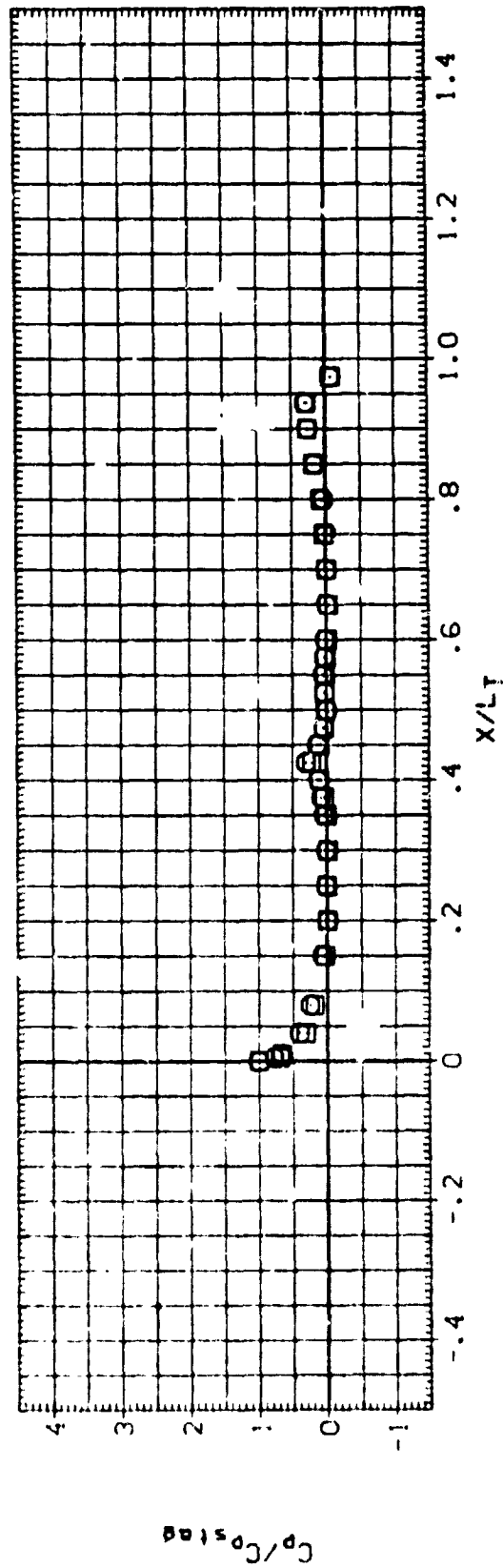
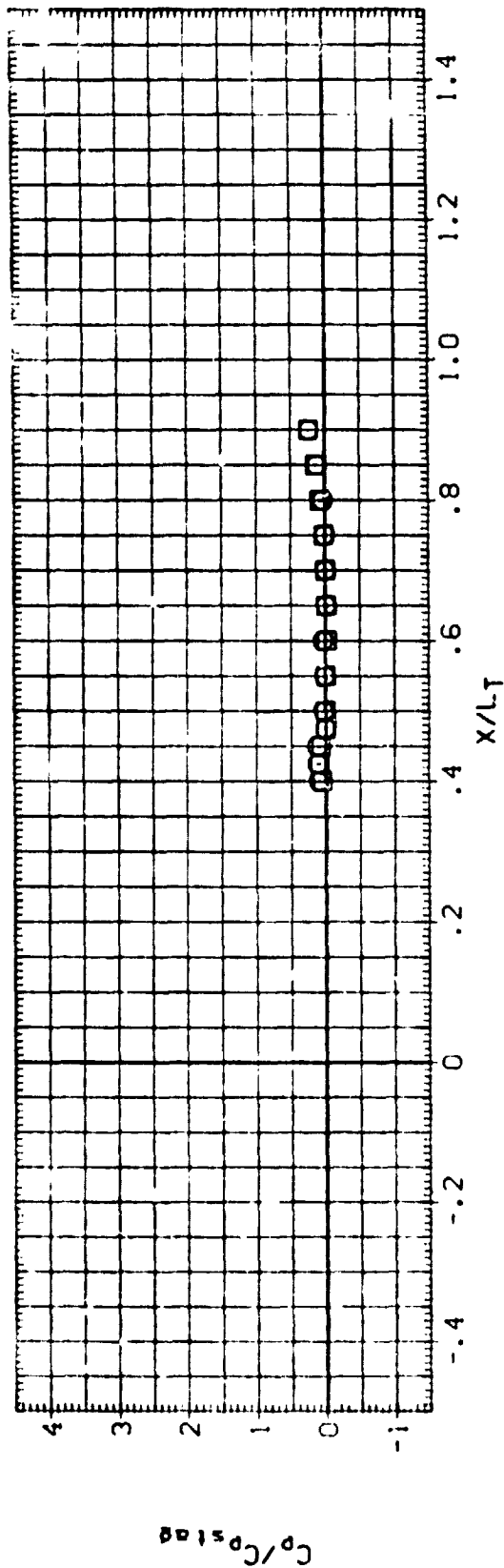


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

[R03TAA] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 0.000 210.000 2.360
 5.000 197.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

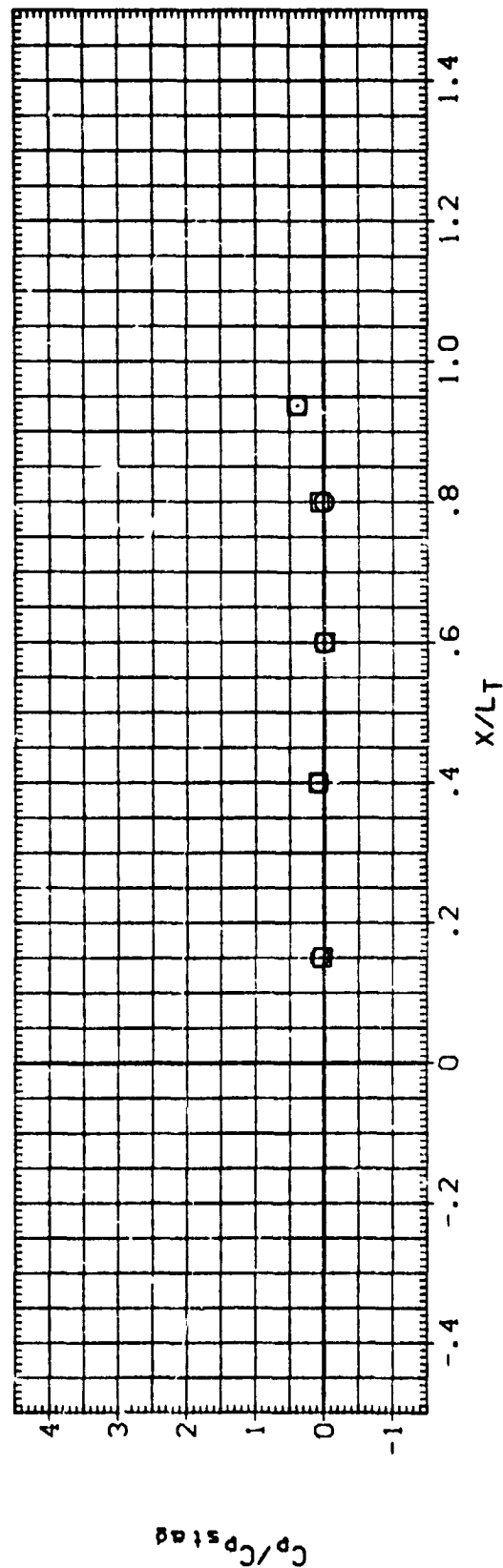
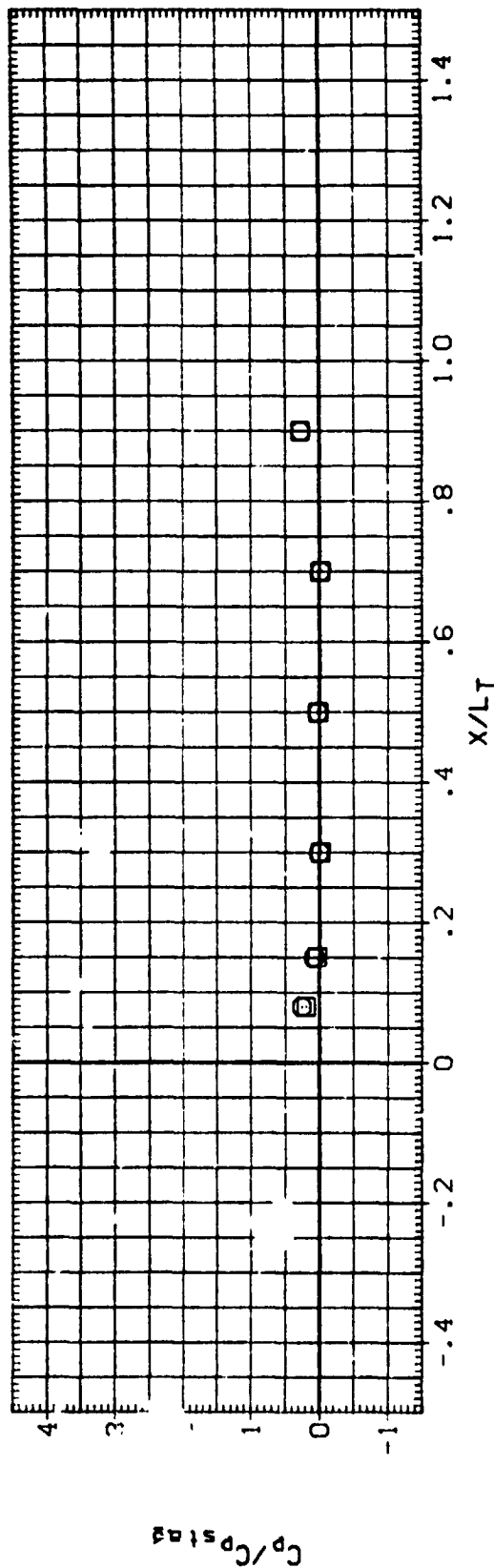


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK, BETA= 0, RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA .000
5.000

THETA 67.500
MACH 2.950
.000

PARAMETRIC VALUES
RN/L 1.200
BETA .000

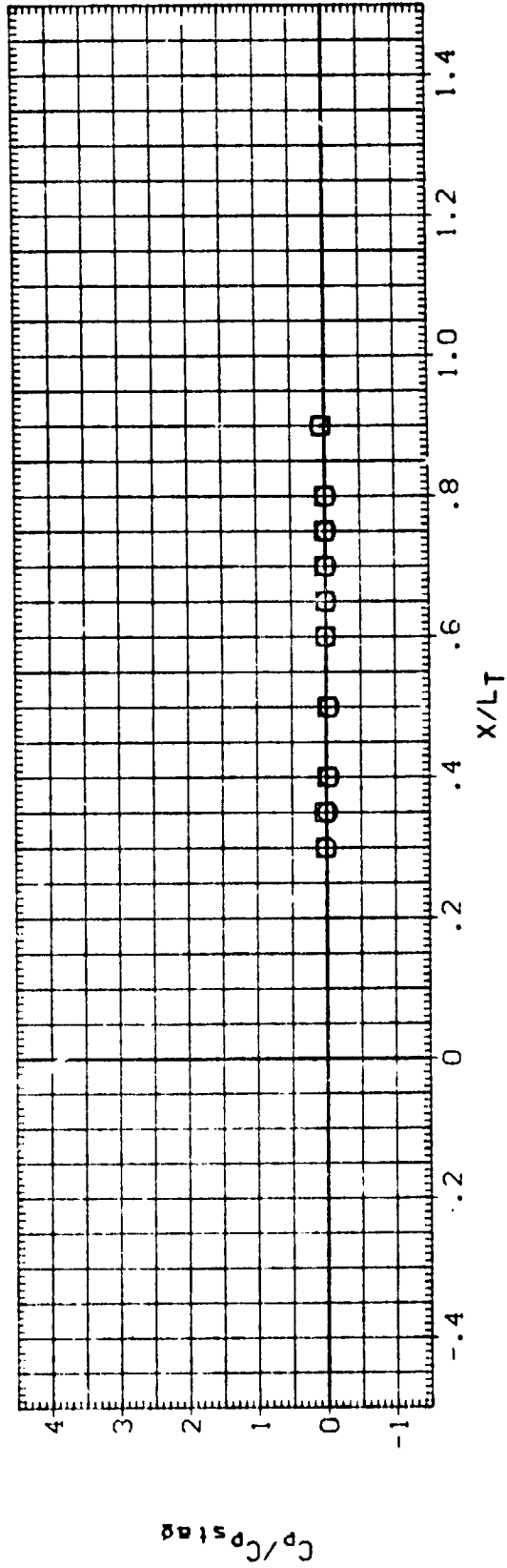
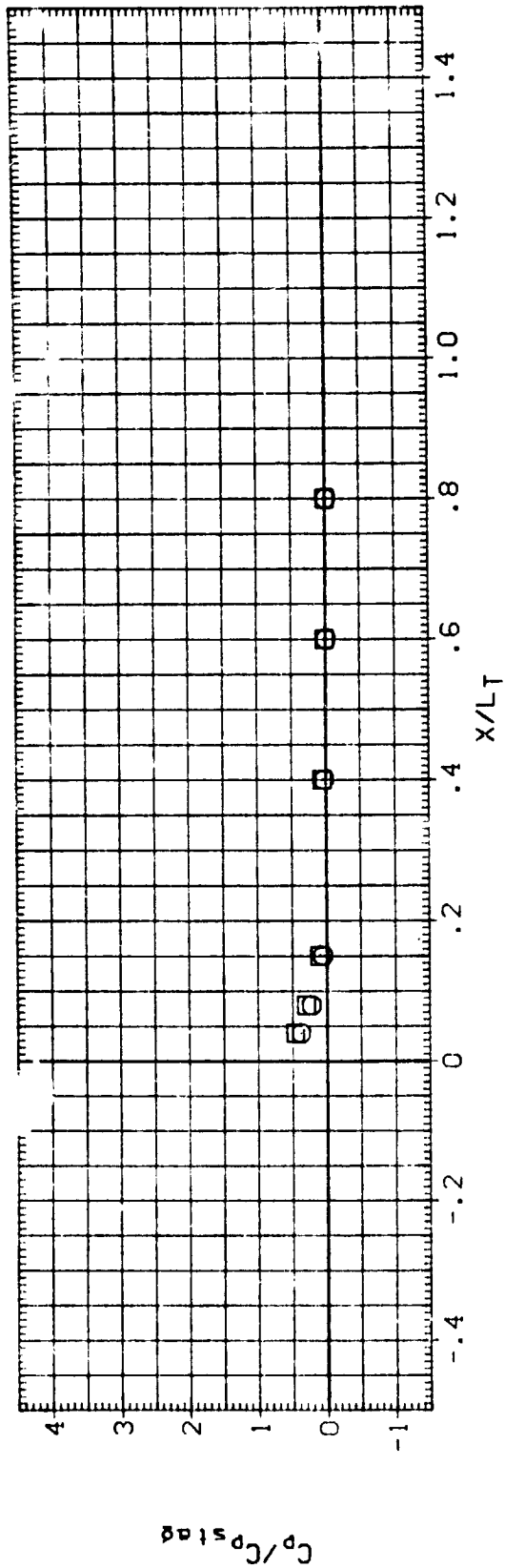


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	RN/L	PARAMETRIC VALUES	BETA
□	.000	112.500	2.950		1.200	.000
	5.000	90.000				

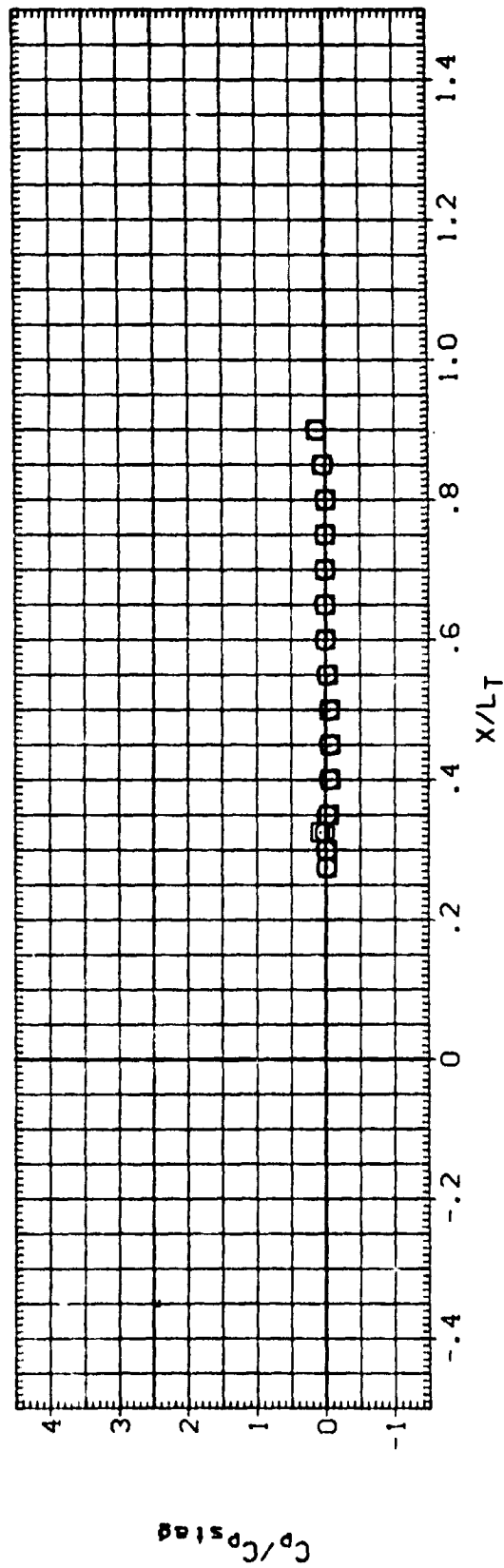
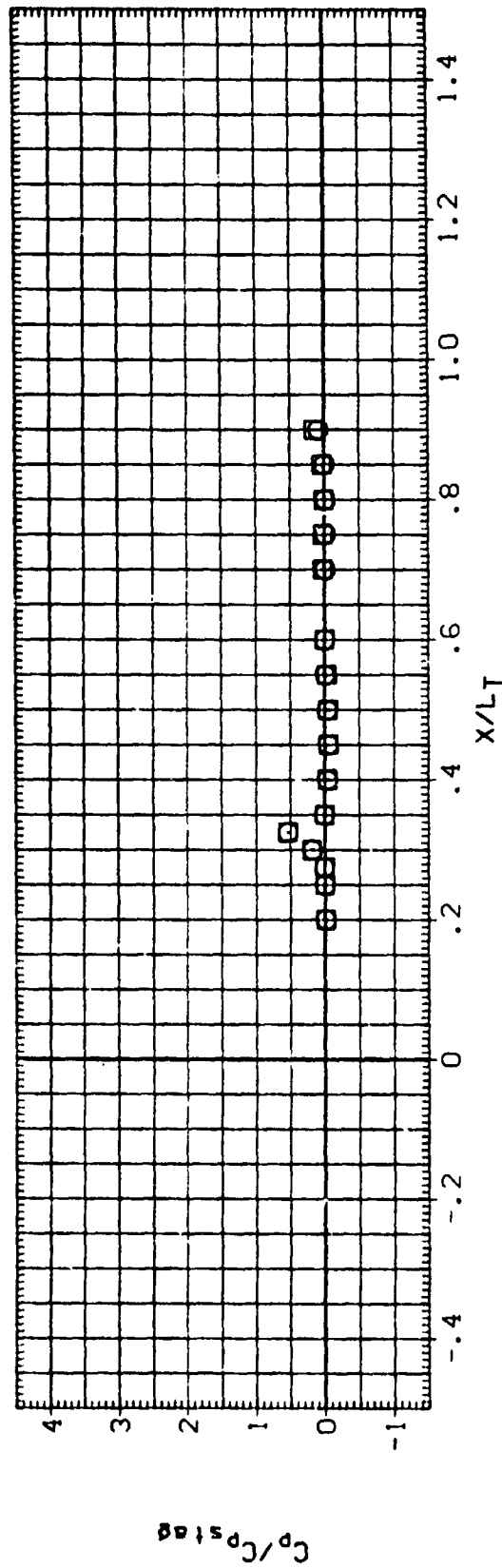


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. $BETA = 0$, $RN/L = 1.2$

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 5.000 135.000 2.950
 123.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

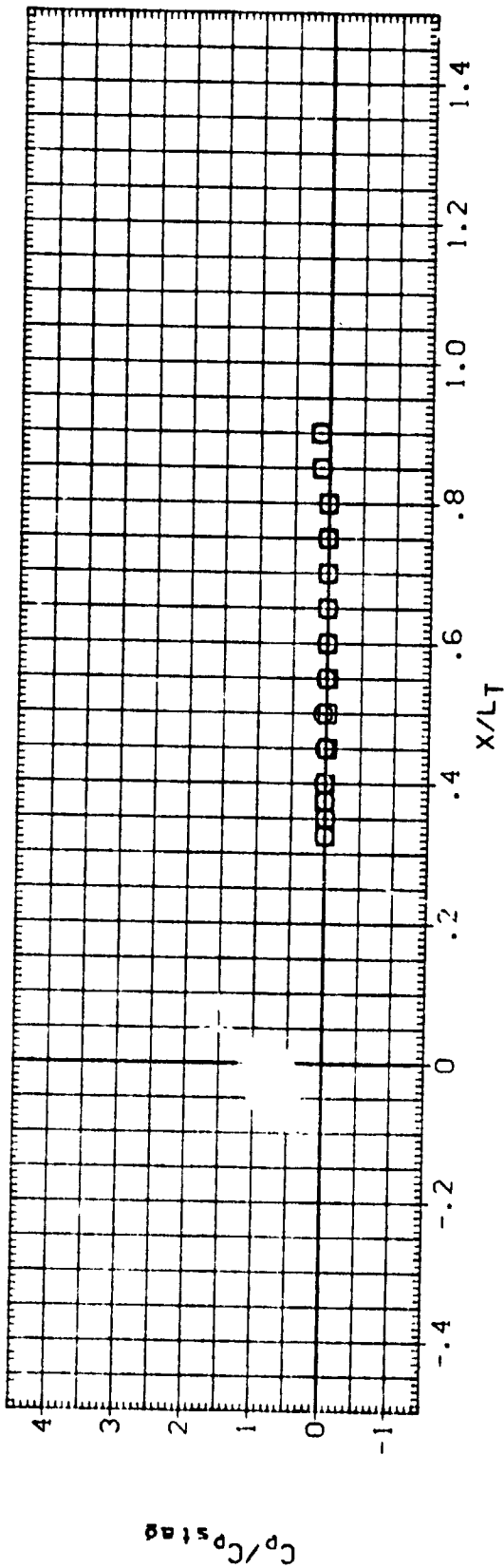
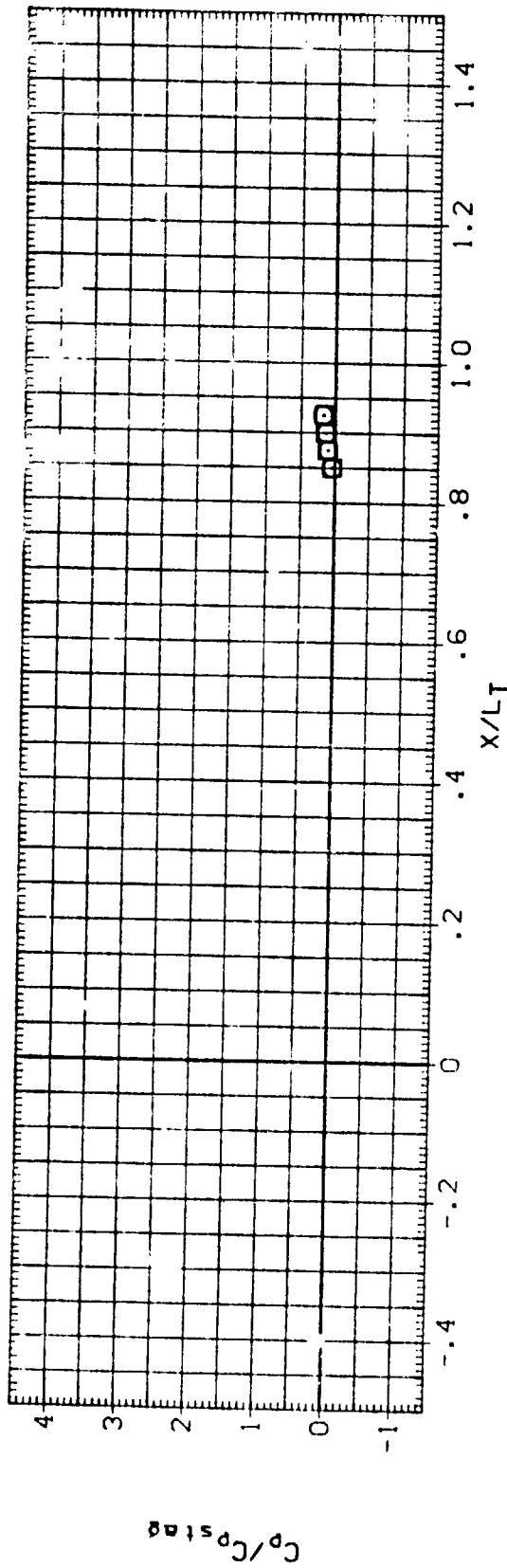


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(RQ31AA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	RN/L	PARAMETRIC VALUES	BETA
□	5.000	180.000	2.950		1.200	.000
		157.500				

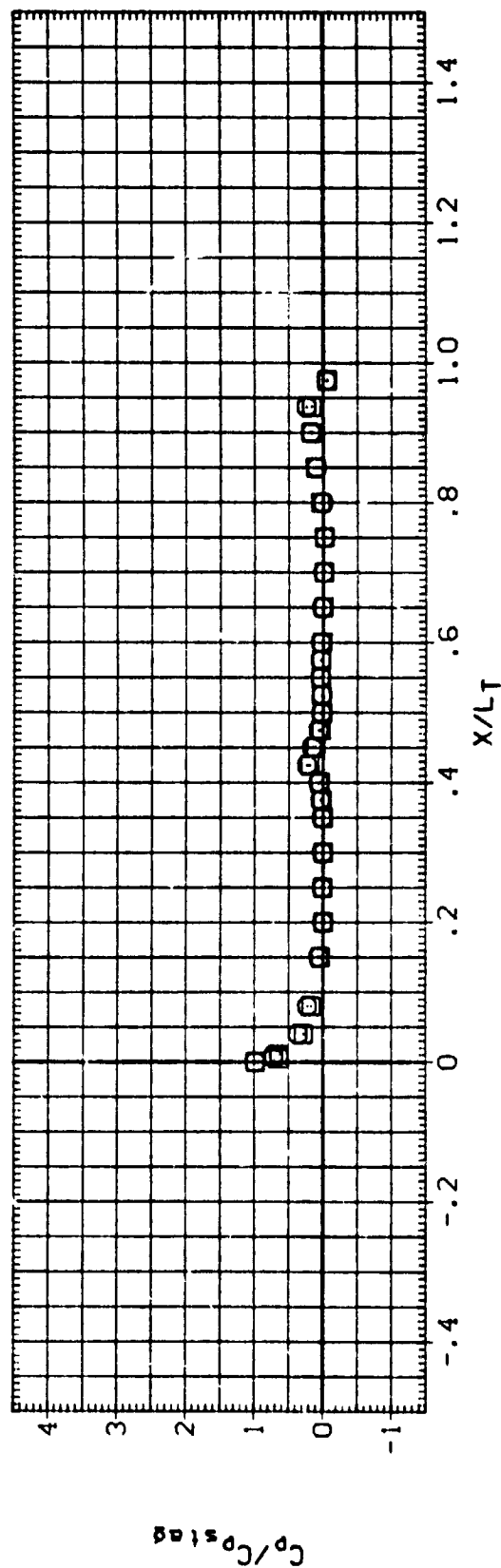
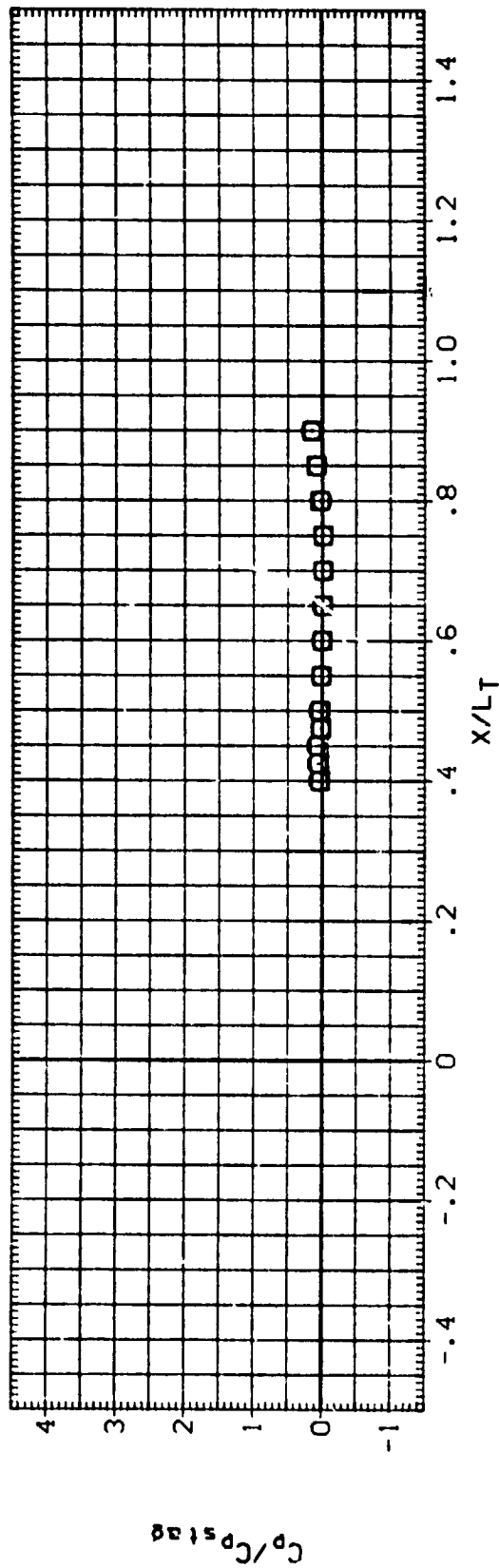


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 0.300 210.000 2.950
 5.000 197.000

PARAMETRIC VALUES
 RN/L 1.200 BETA 0.000

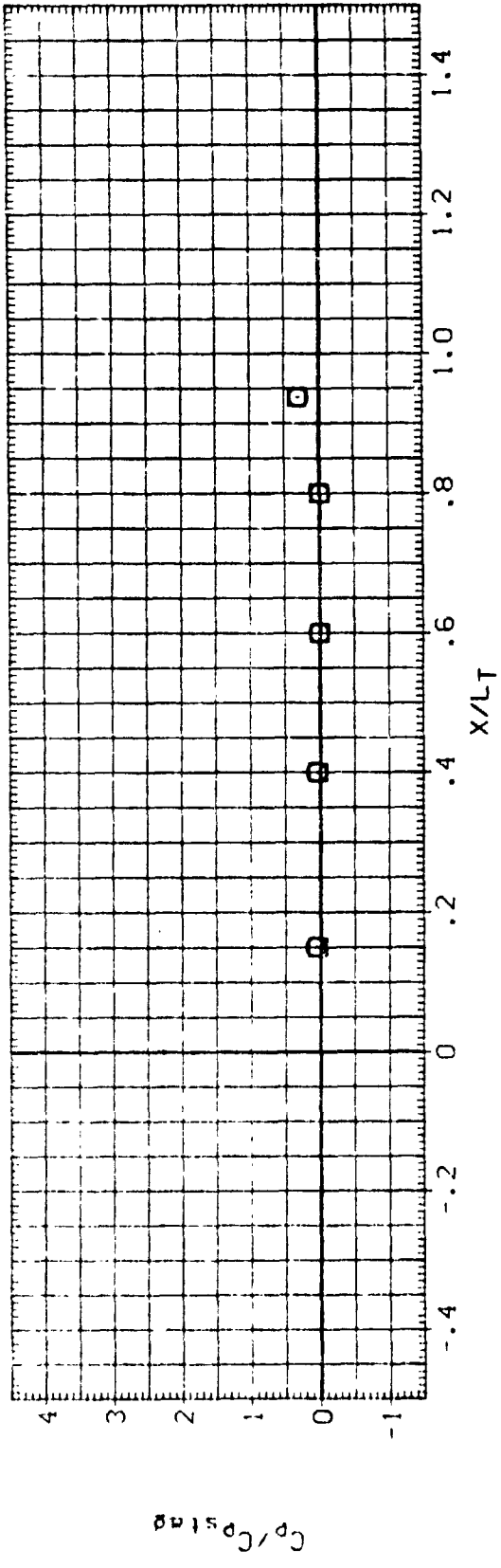
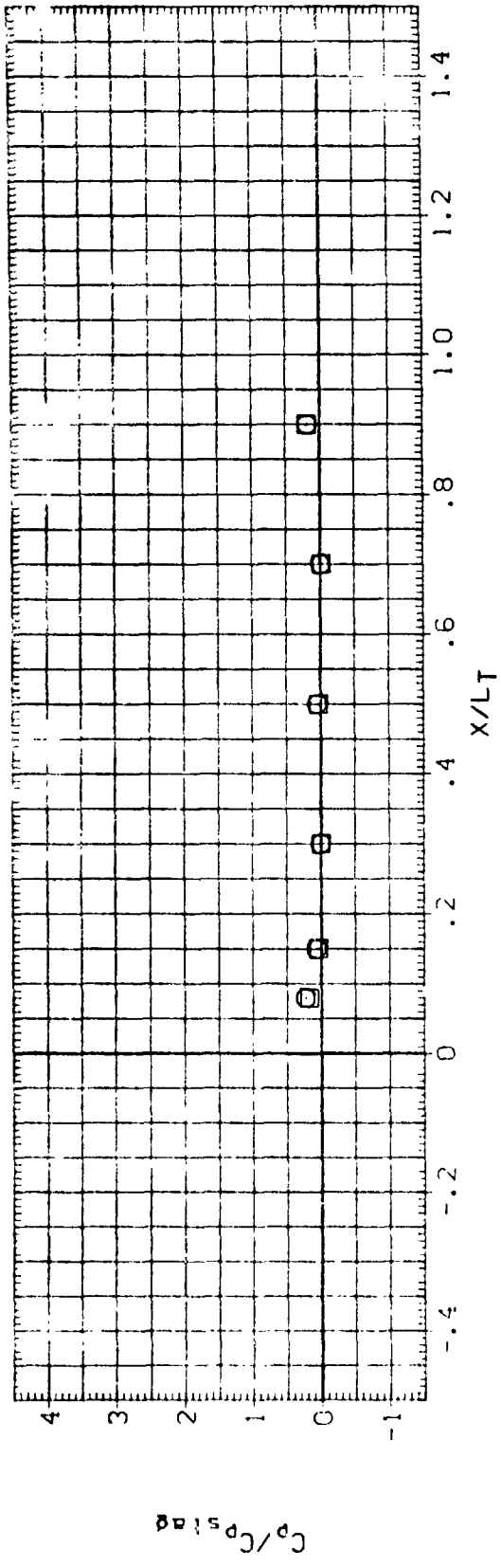



FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL  ALPHA -5.000

THETA 67.500 MACH 3.700

PARAMETRIC VALUES
RN/L 1.200 BETA .000

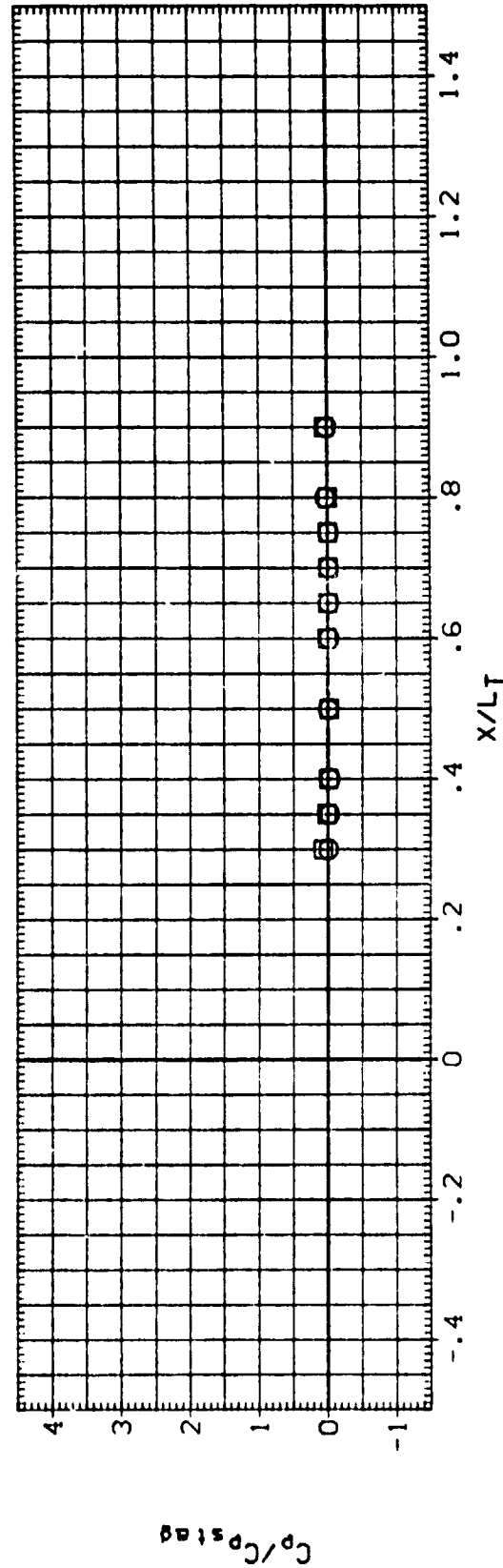
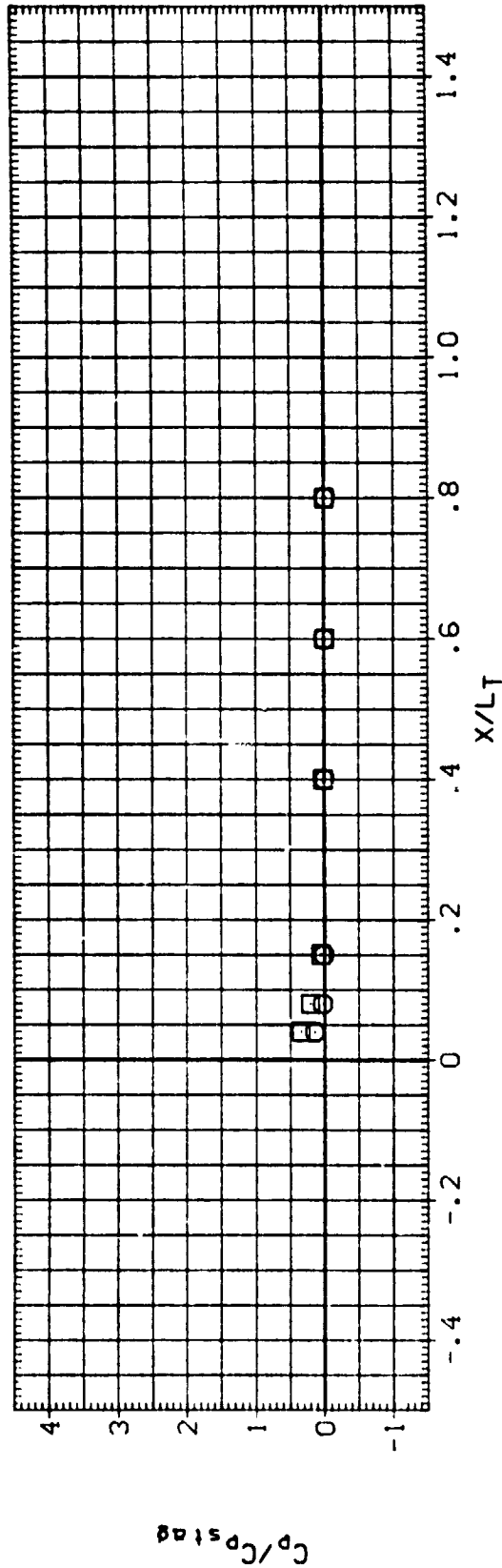


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK, BETA= 0. RN/L= 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 0 -5.000 112.500 3.700
 0 .000 30.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

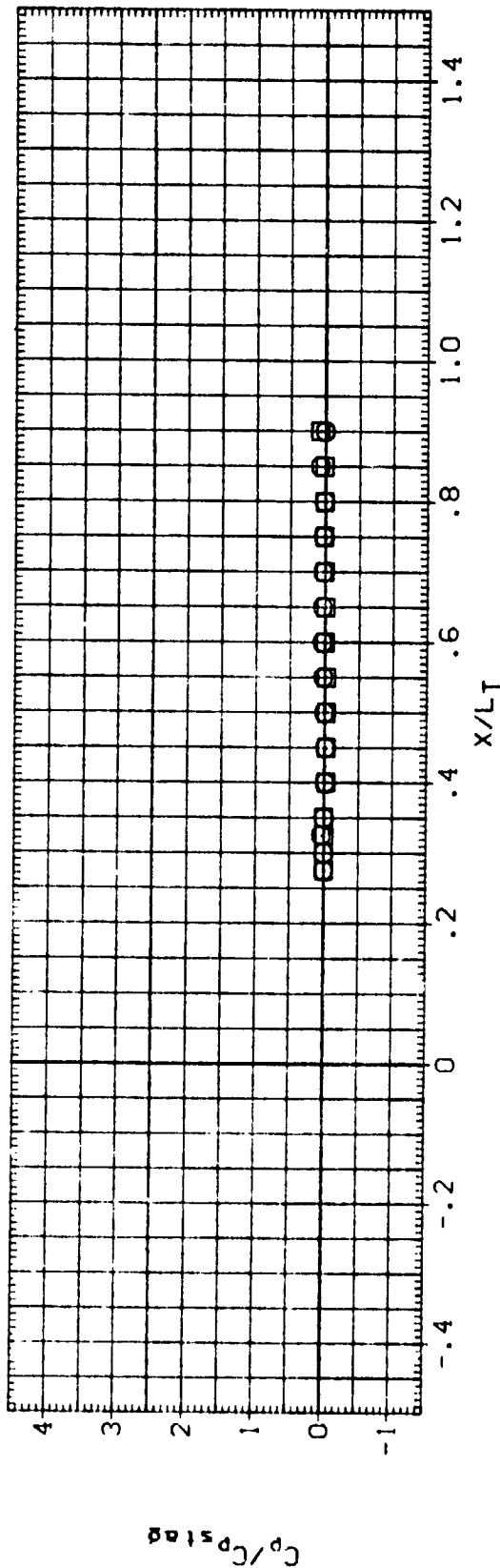
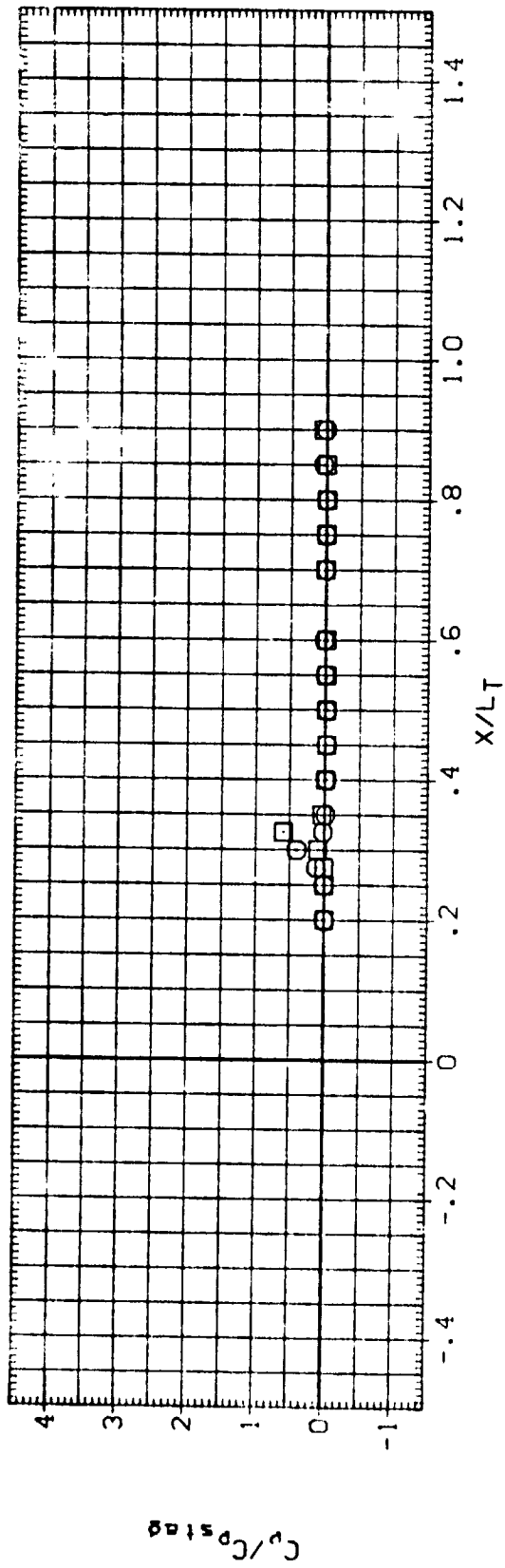


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. $BETA = 0$. $RN/L = 1.2$

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK
 SYMBOL ALPHA THETA MACH
 -5.000 135.000 3.700
 .000 123.000
 PARAMETRIC VALUES
 RN/L 1.200 BETA .000

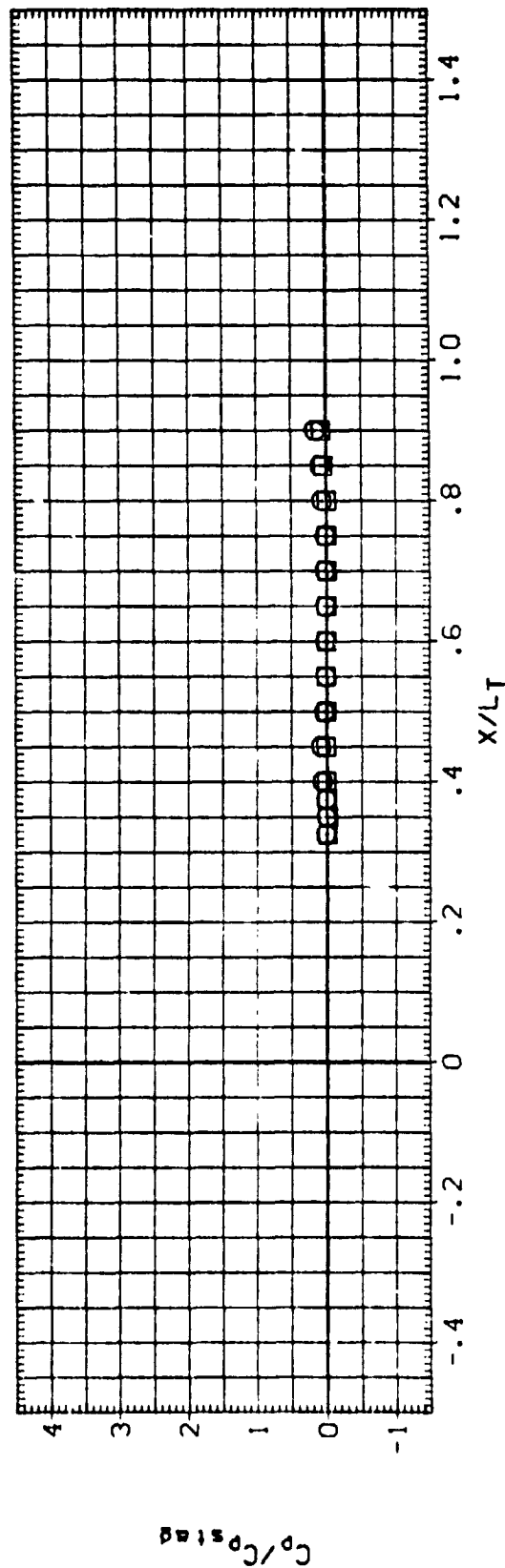
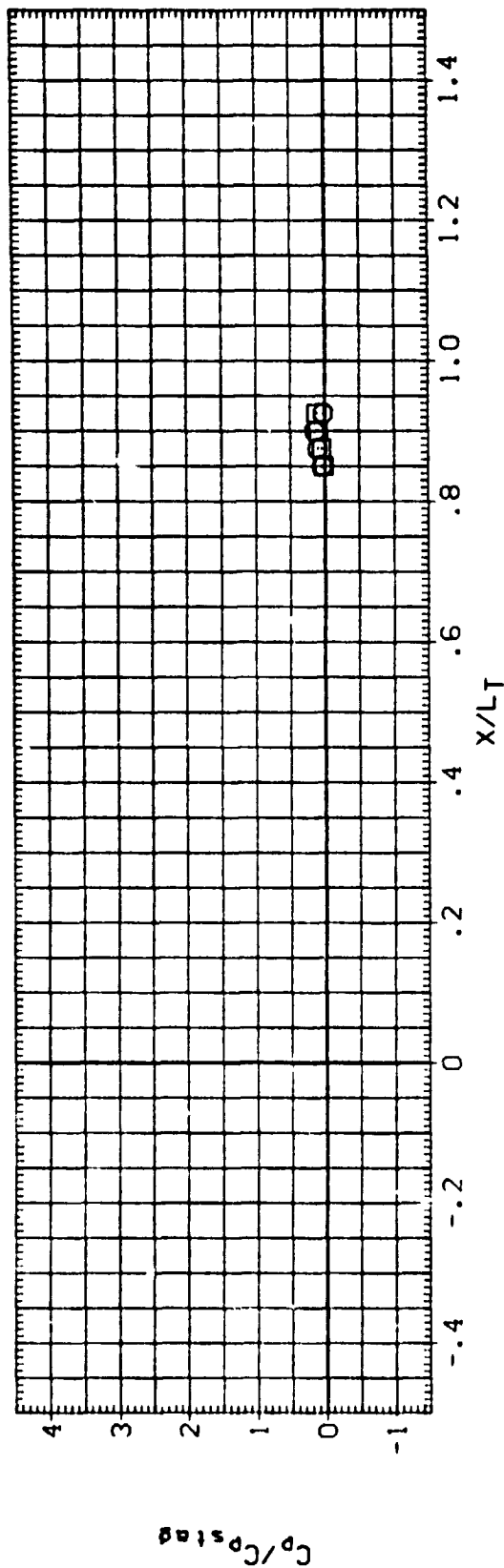


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 □ -5.000 180.000 3.700
 □ .000 157.500

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

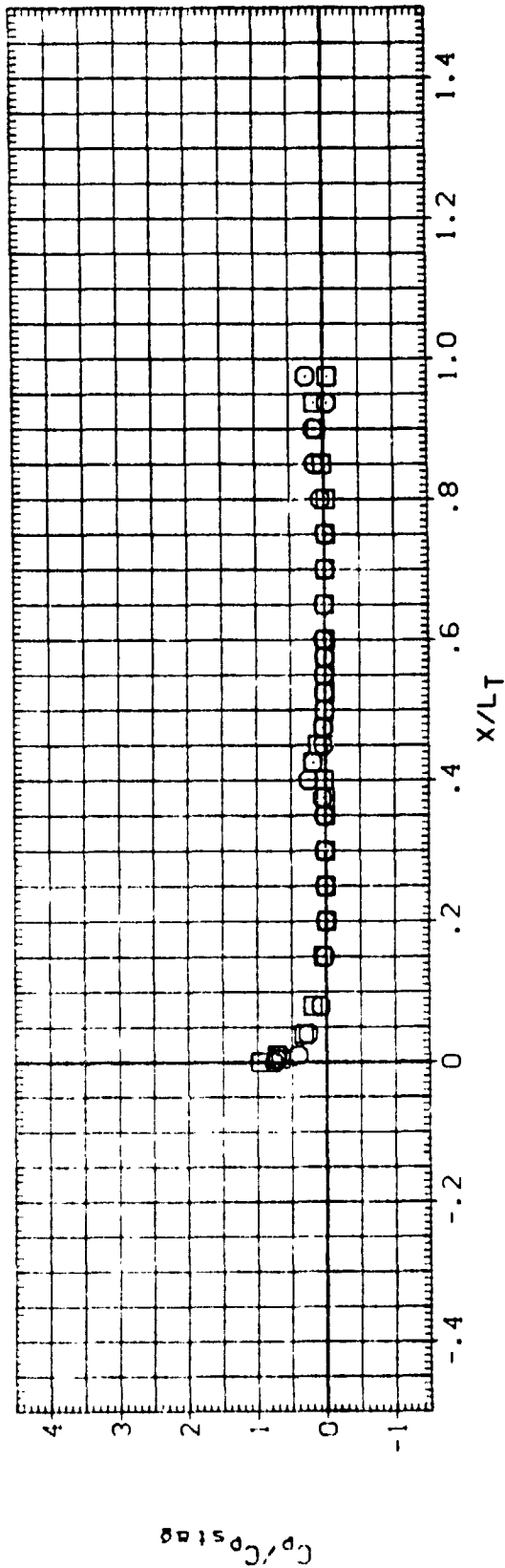
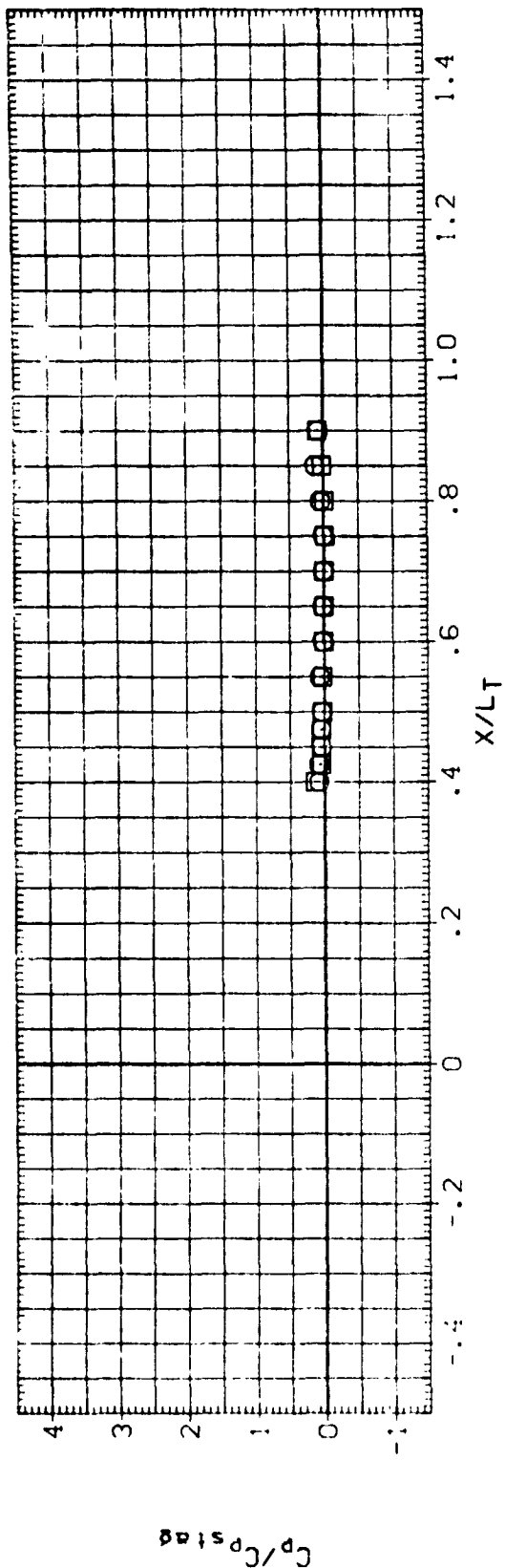
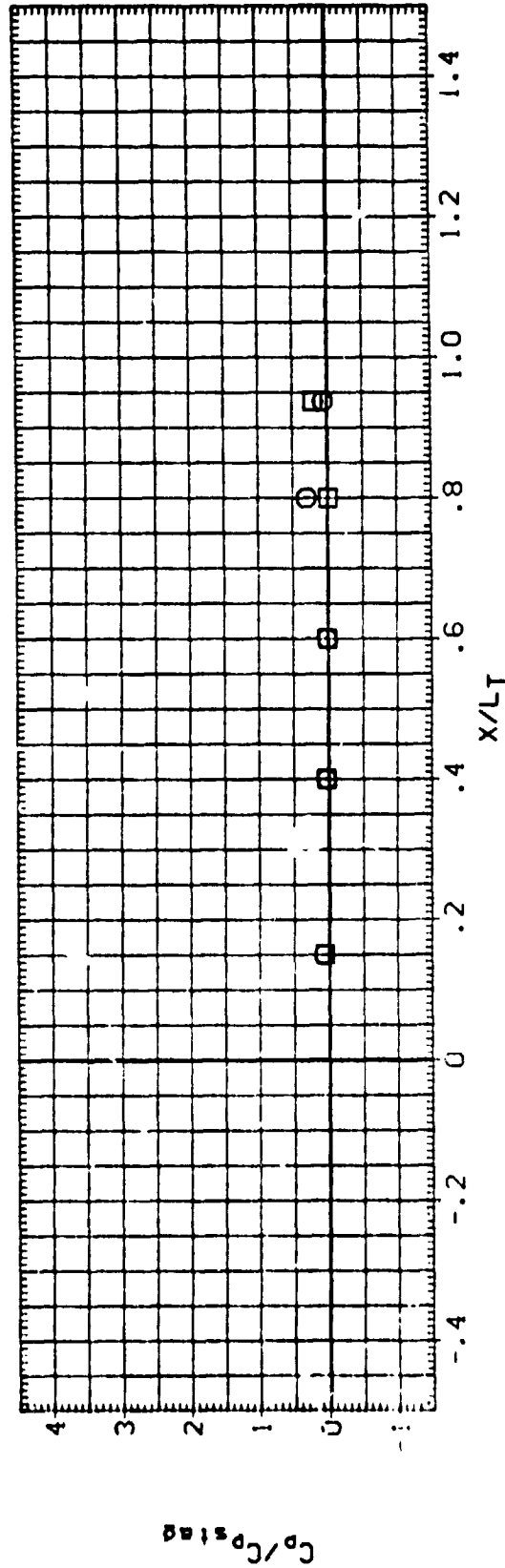
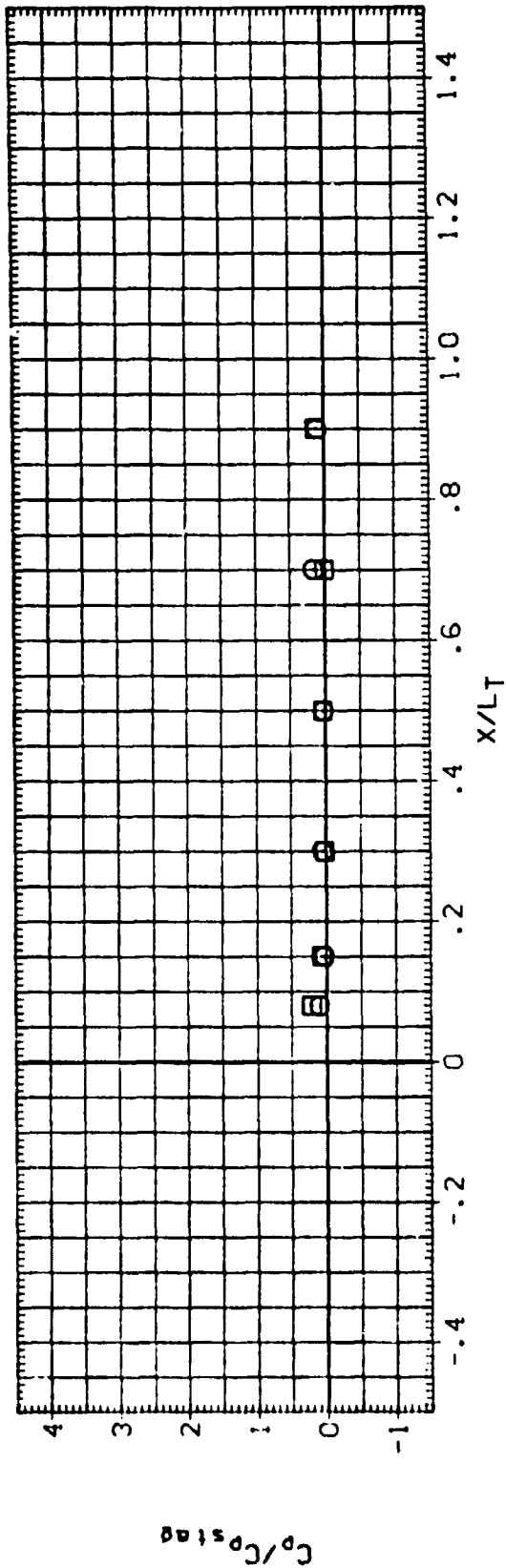


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 □ -5.000 210.000 3.700
 .000 197.030

PARAMETRIC VALUES
 RN/L 1.200 BETA .000



(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA BETA MACH
 □ -5.000 67.500 4.600
 .000 .000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

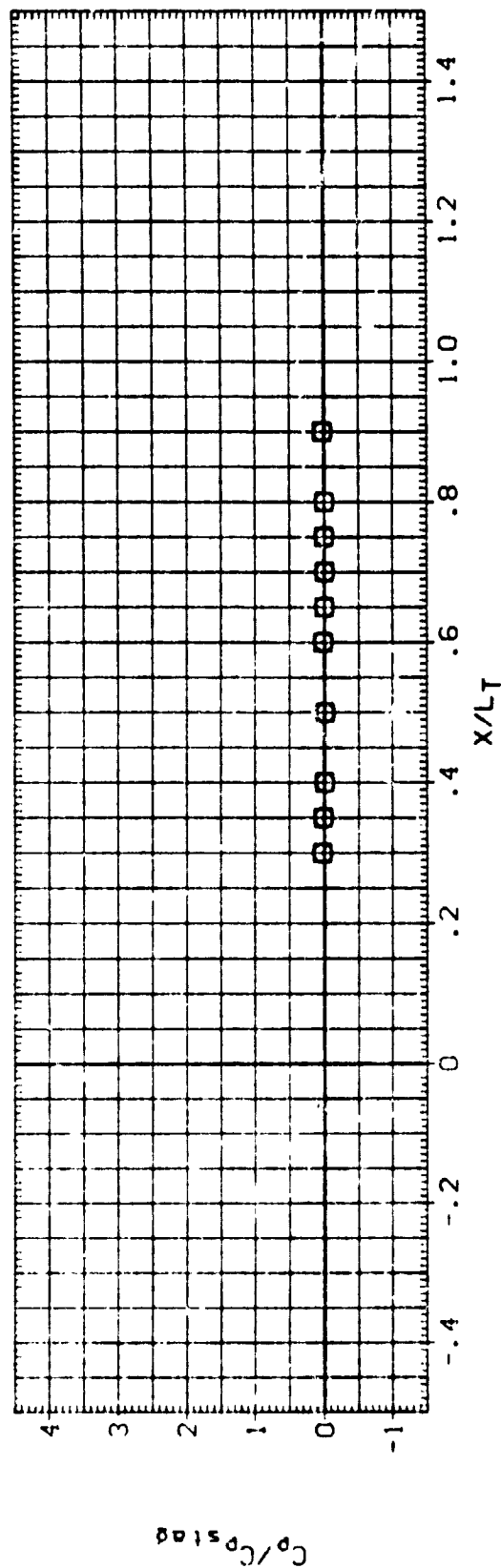
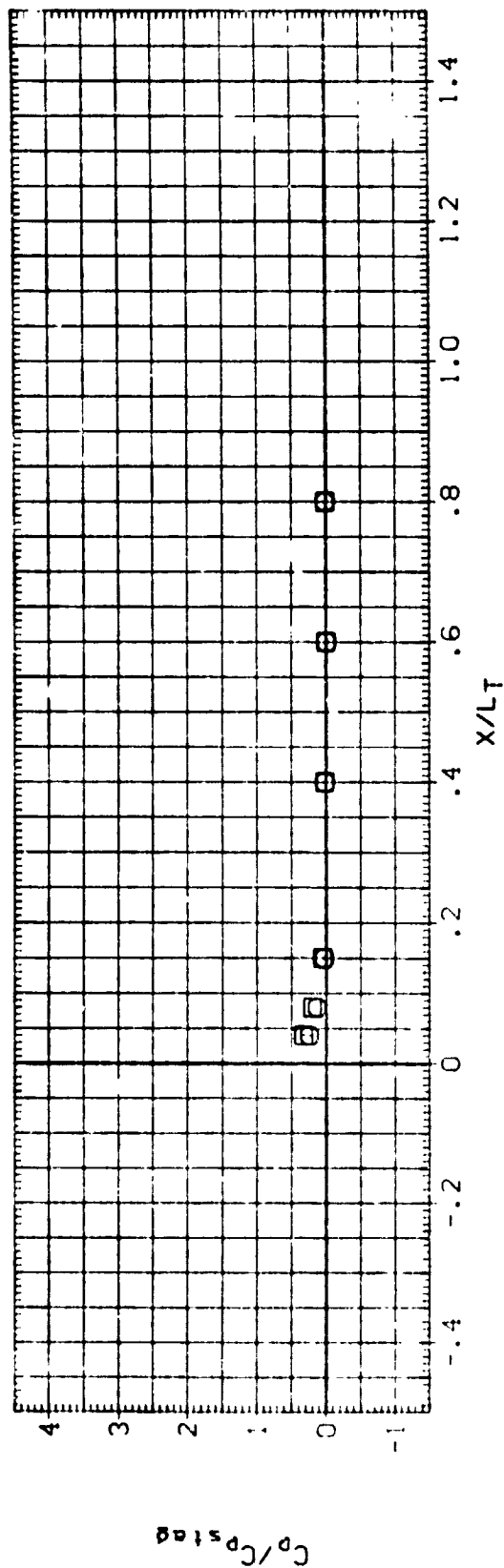


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT .059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA TIME TA MACH
 □ -5.000 112.500 4.600
 .000 90.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

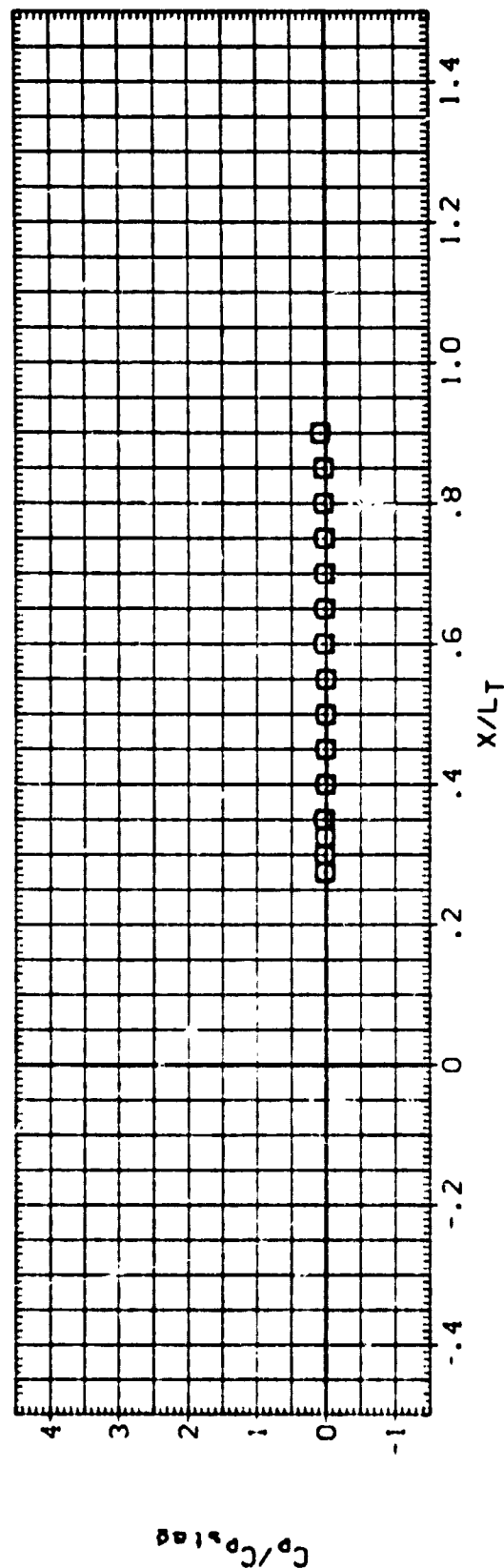
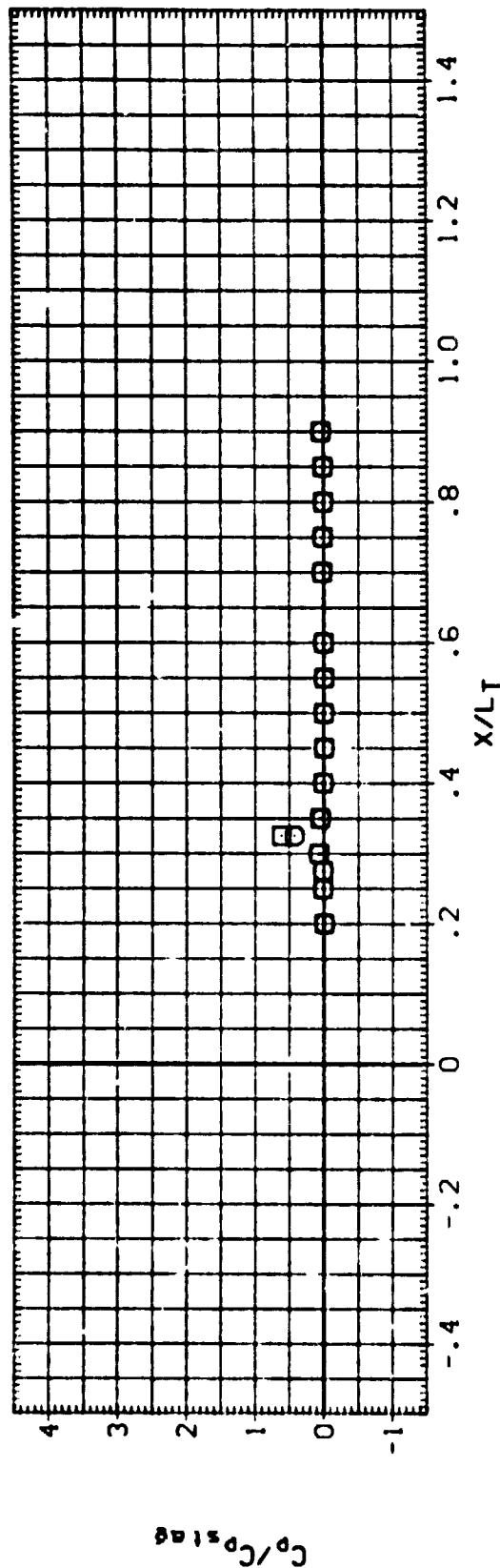


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK. BETA= 0. RN/L= 1.2

ALPHA
-5.000
135.003
123.000

PARAMETRIC VALUES
RN/L 1.200 BETA .000

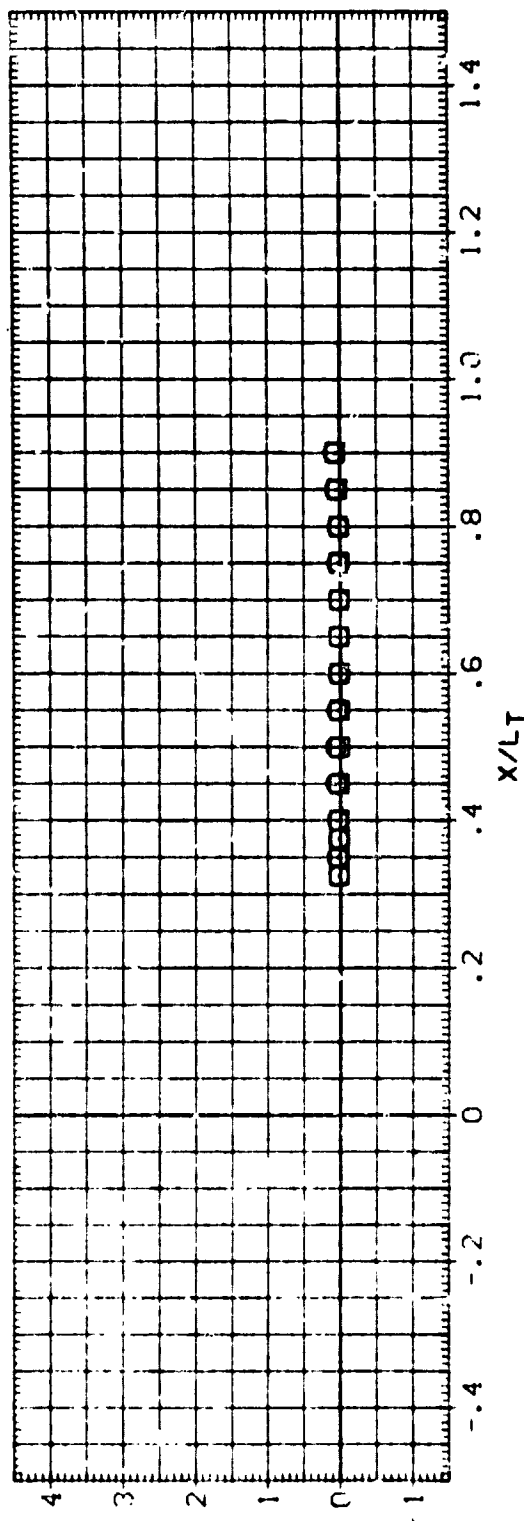
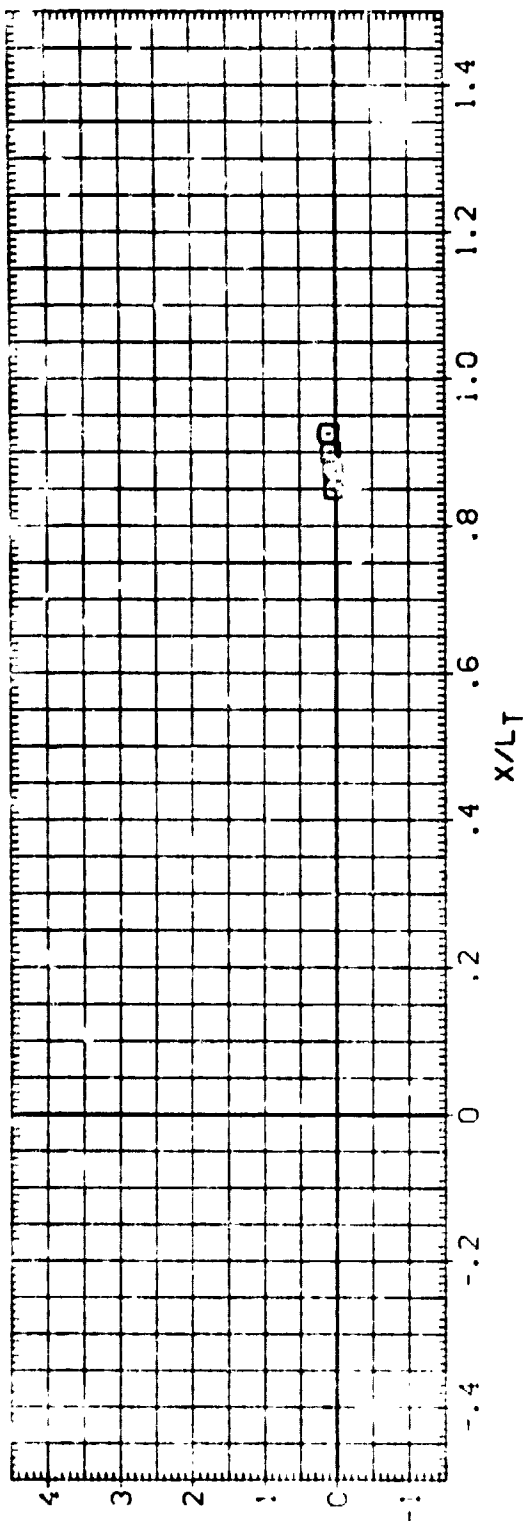


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. $BETA = 0$. $RN/L = 1.2$

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N10 EXTERNAL TANK

SYN JOL	ALPHA	THETA	MACP	RN/L	PARAMETRIC VALUES
0	-5.000	180.000	4.600	1.200	BETA
	.000	157.500			.000

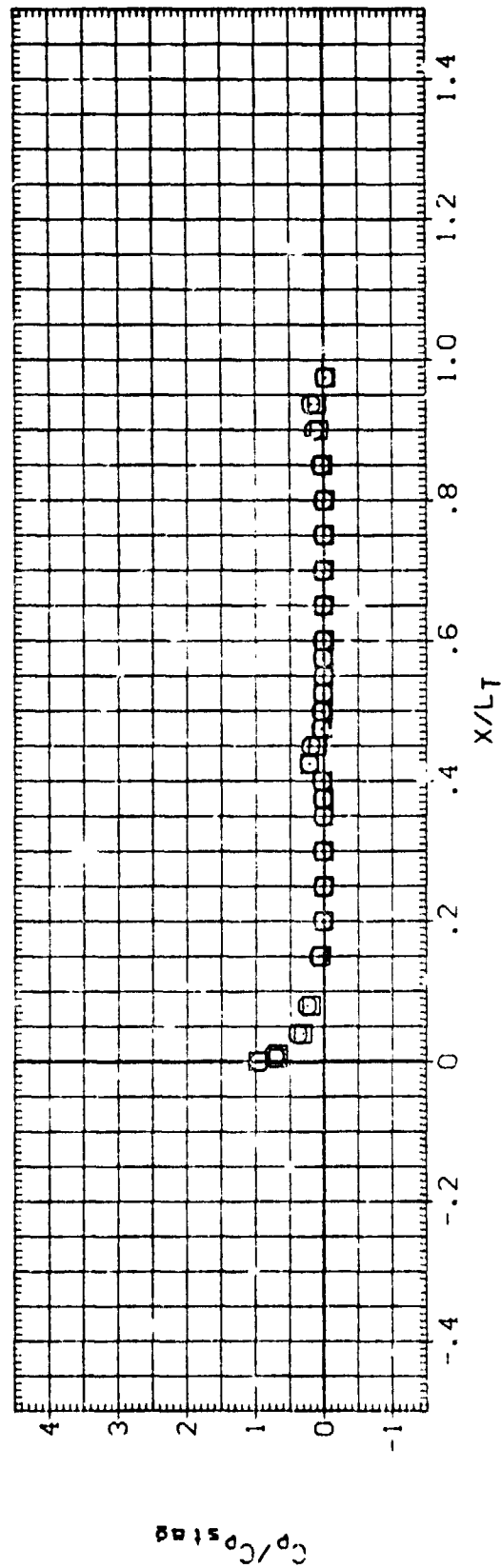
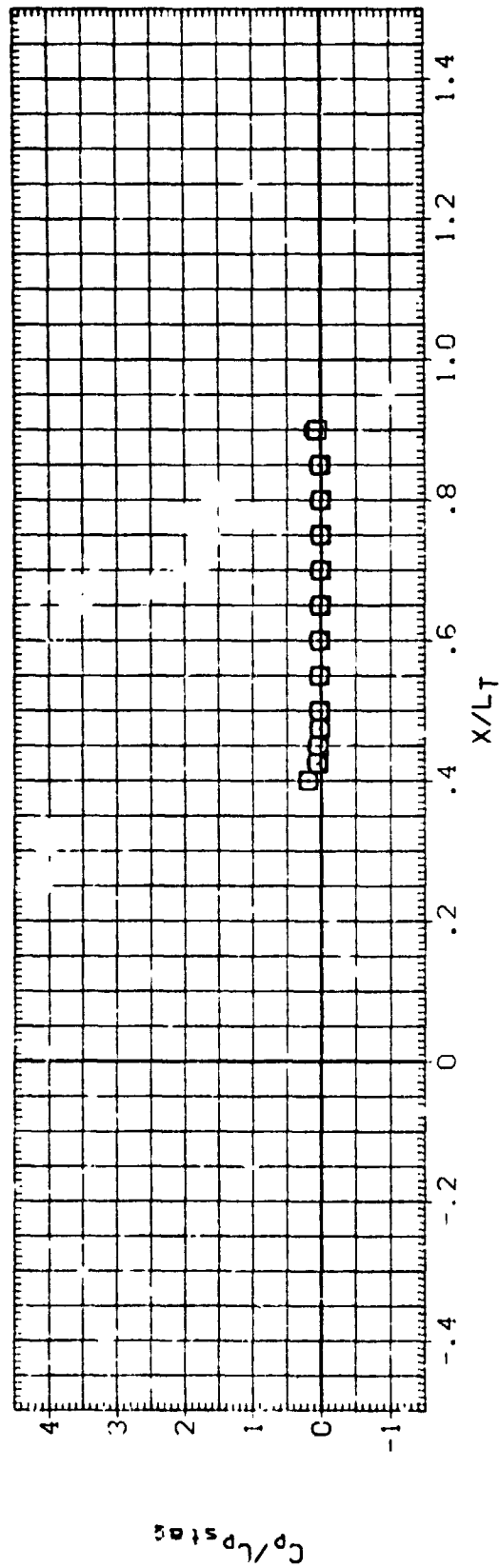


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -5.000 210.000 4.500
 .000 197.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

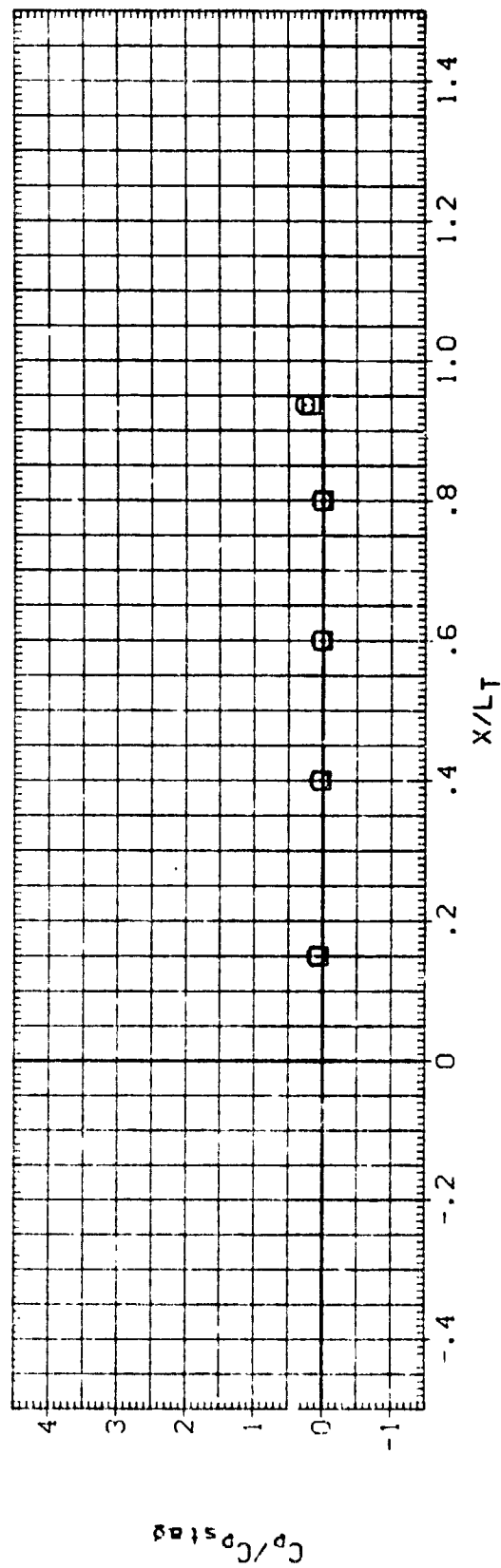
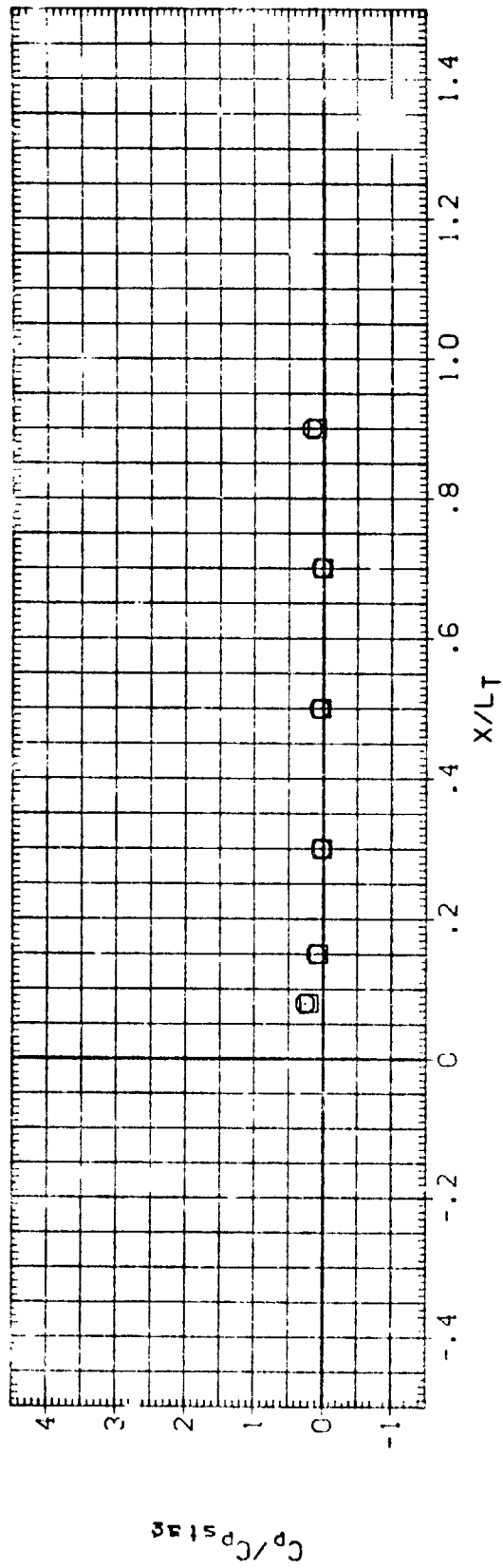


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0, RN/L= 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ .000 .350 2.360
 □ .000 .300

PARAMETRIC VALUES
 1.200 BETA .000

RN/L

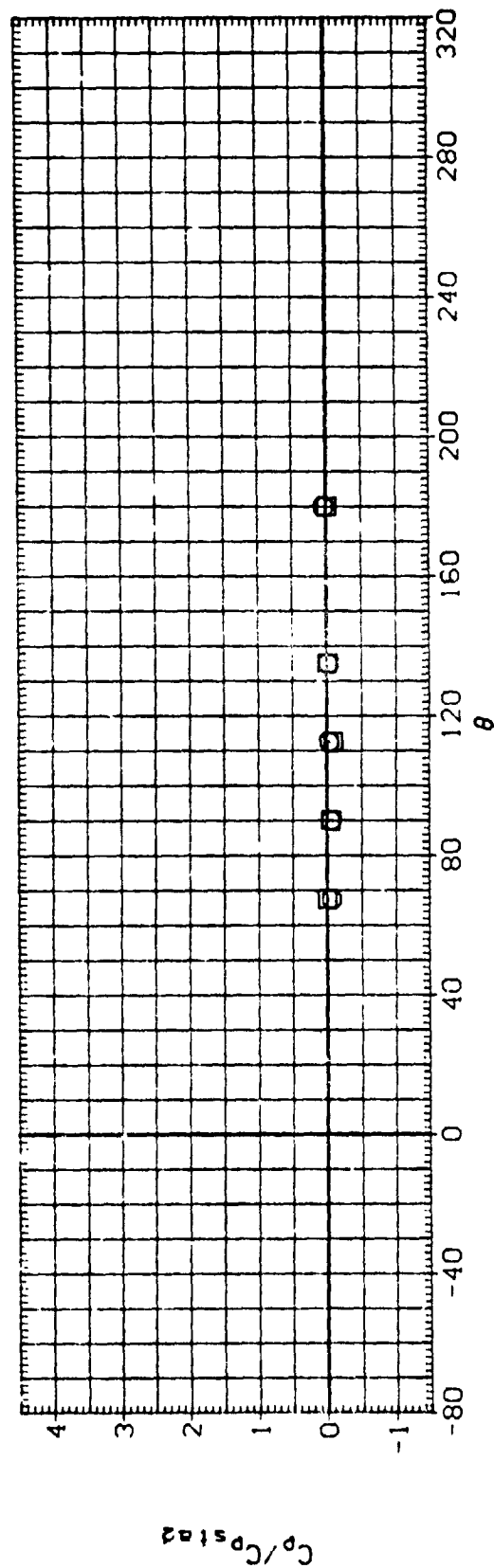
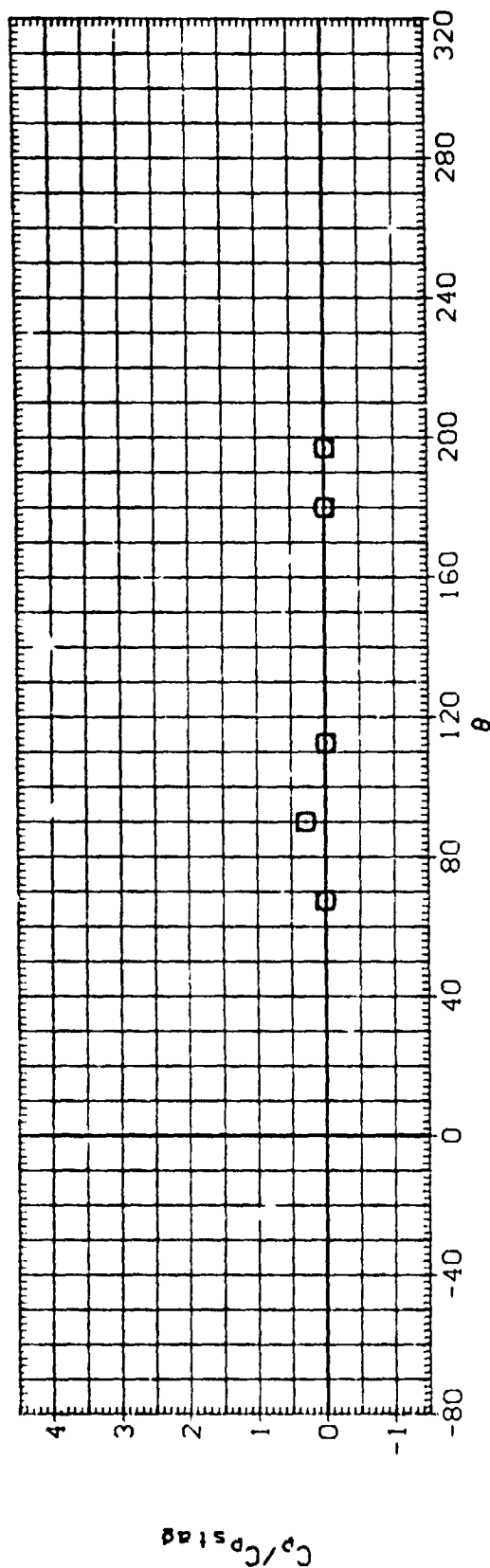


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 .000 .500 2.360
 5.000 .400

PARAMETRIC VALUES
 RN/L 1.200 BE/A .000

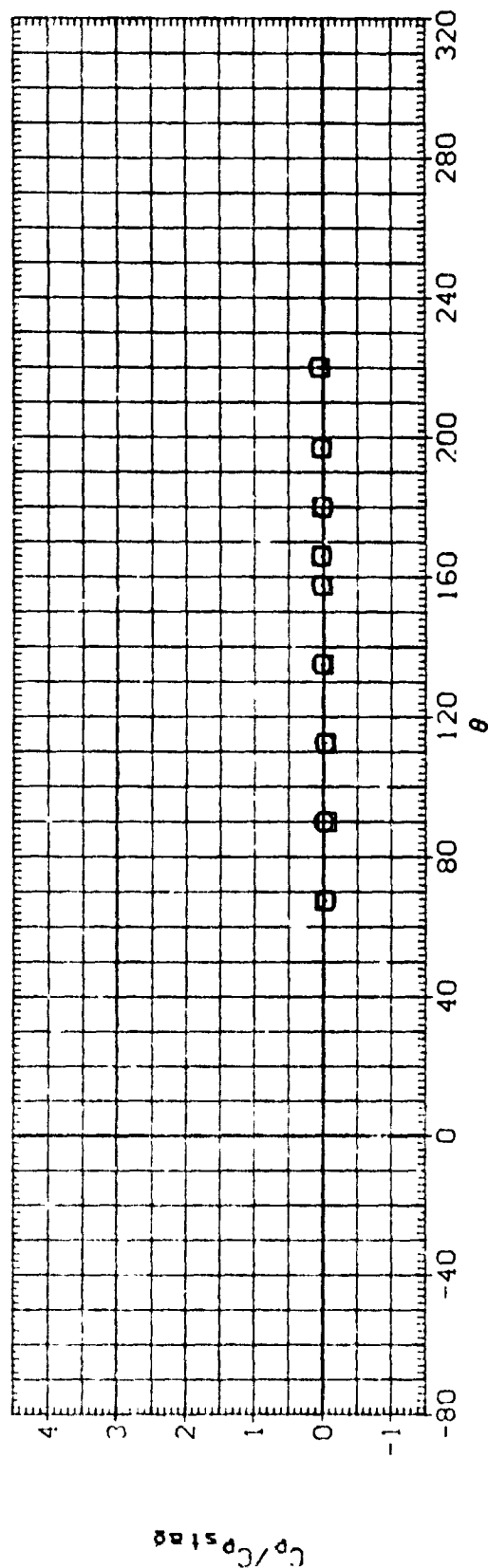
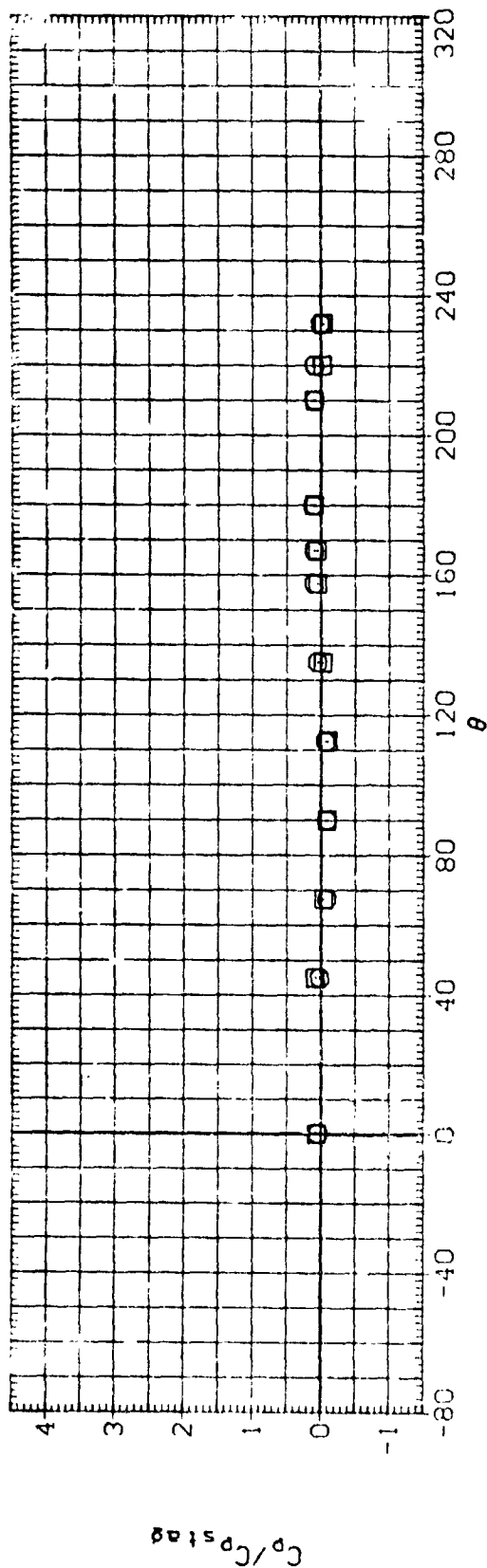


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BE/A= 0. RN/L= 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	PARAMETRIC VALUES
□	.000	.600	2.360	1.200 BETA
□	5.000	.550		

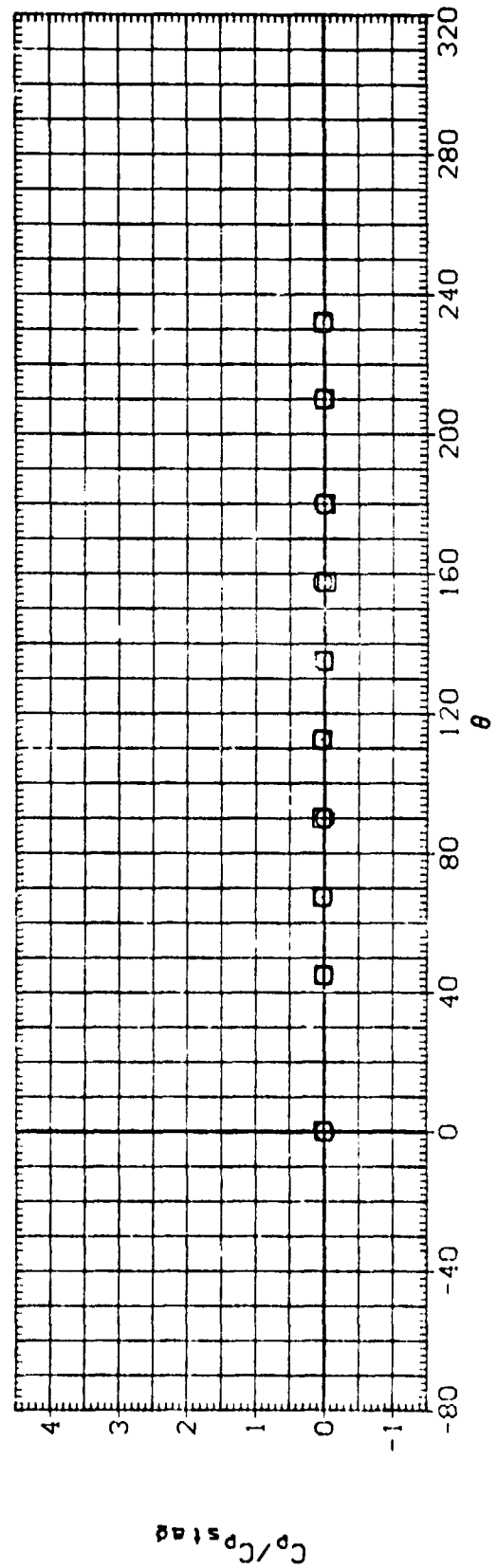
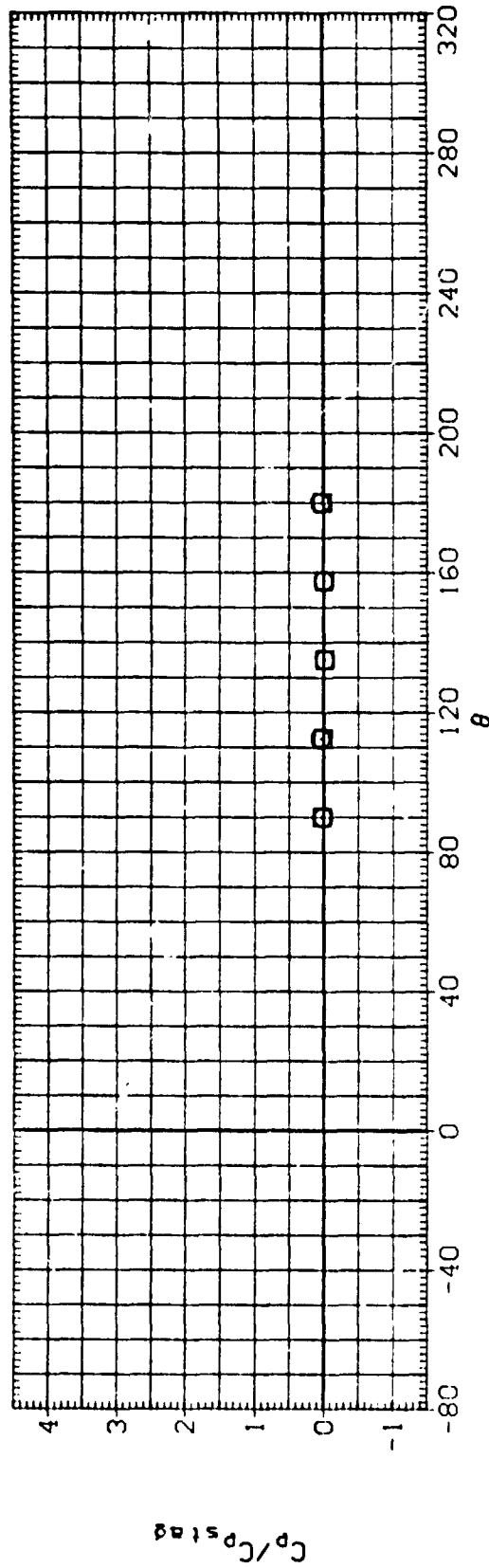


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. $RN/L= 1.2$

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK
 SYMBOL ALPHA X/LT MACH
 .000 .700 2.360
 5.000 .650

PARAMETRIC VALUES
 1.200 BETA .000
 RN/L

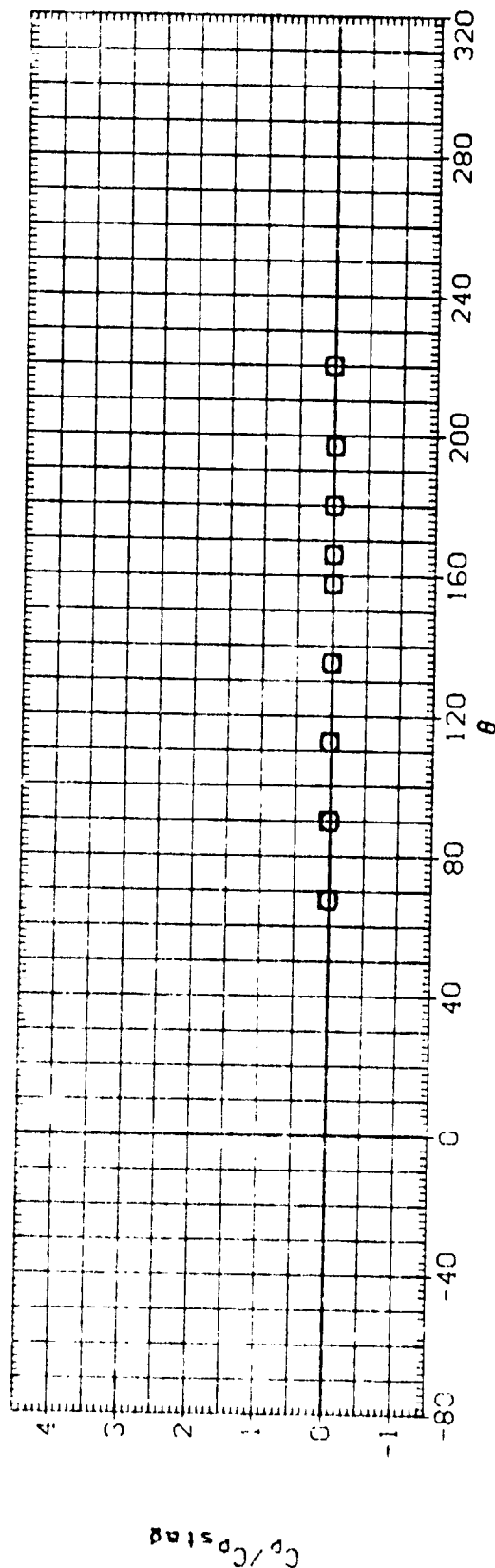
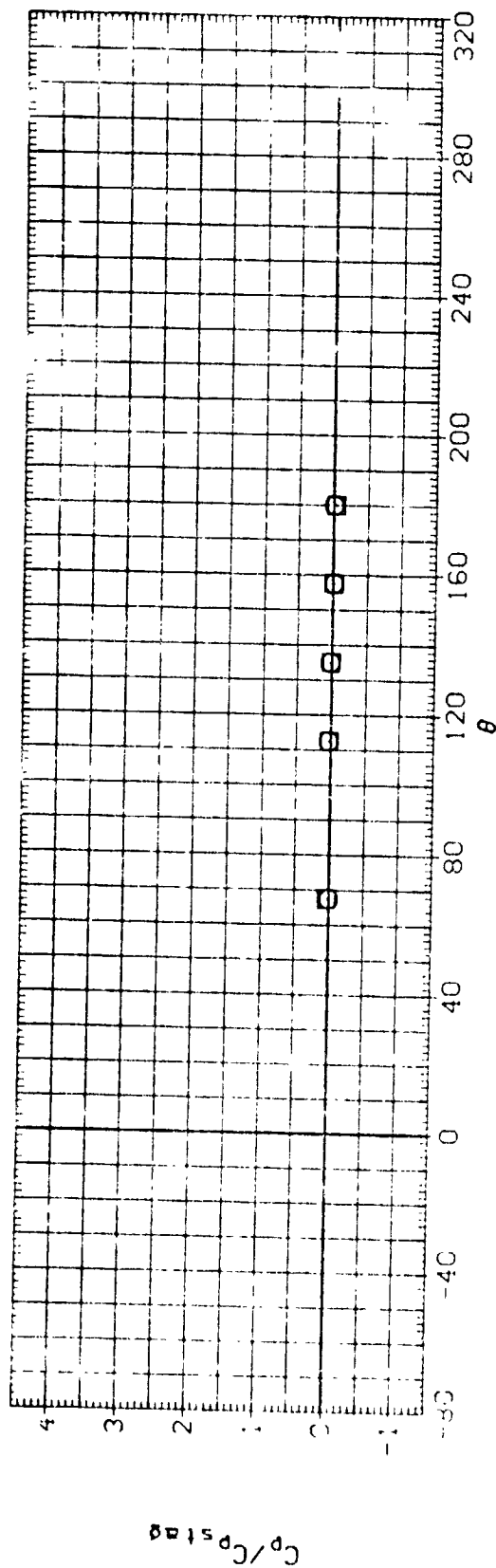


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N1G EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ .000 .800 2.360
 □ .000 .750

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

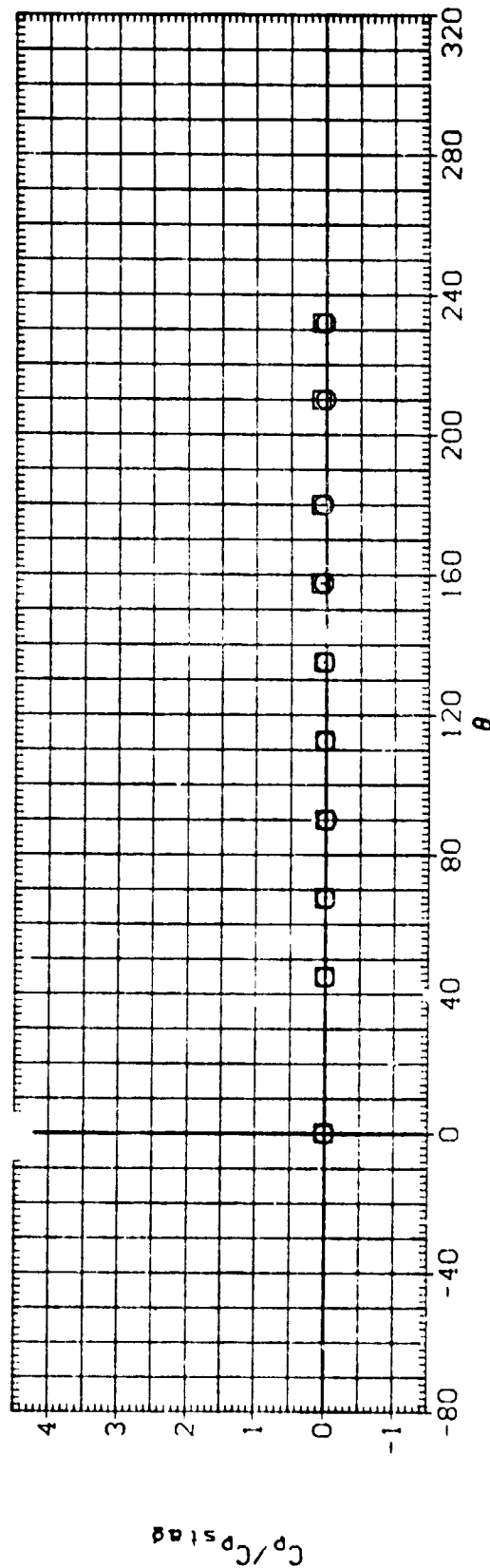
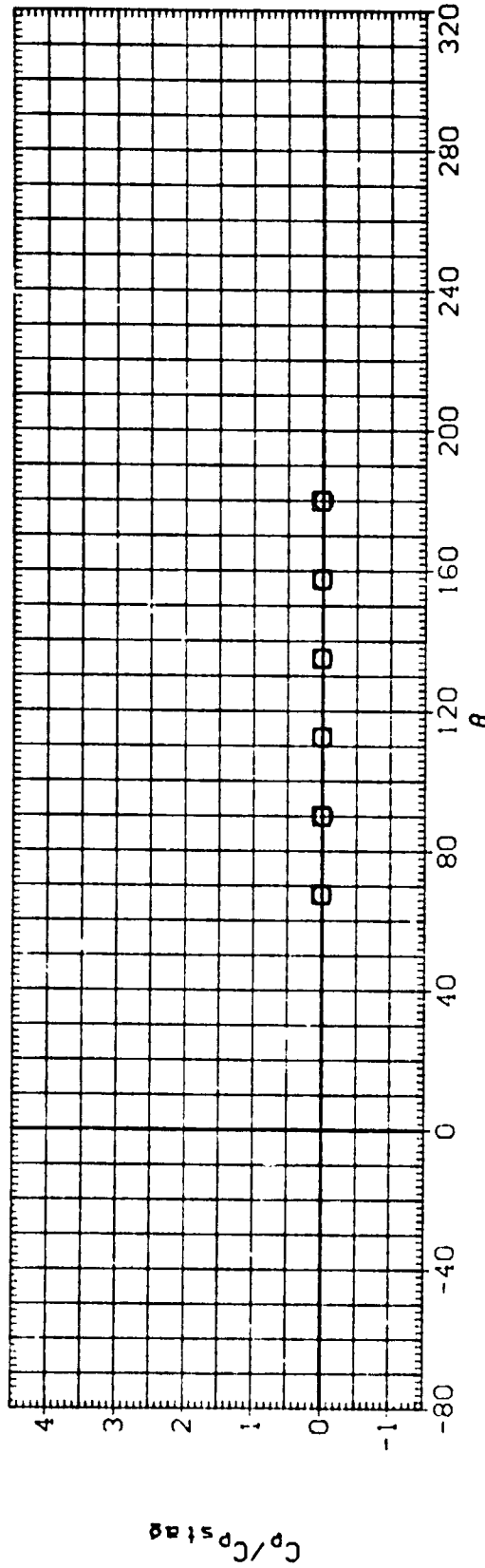


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. FN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 .000 .900 2.36C
 .000 .850

PARAMETRIC VALUES
 1.200 BETA .000

RN/L

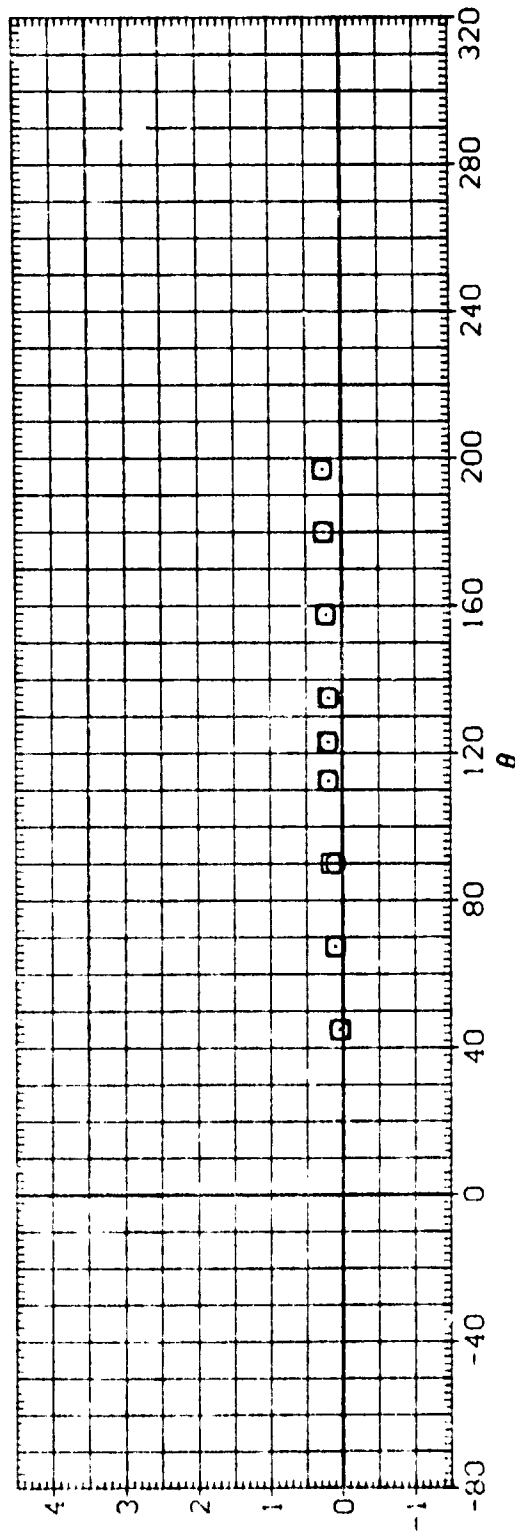
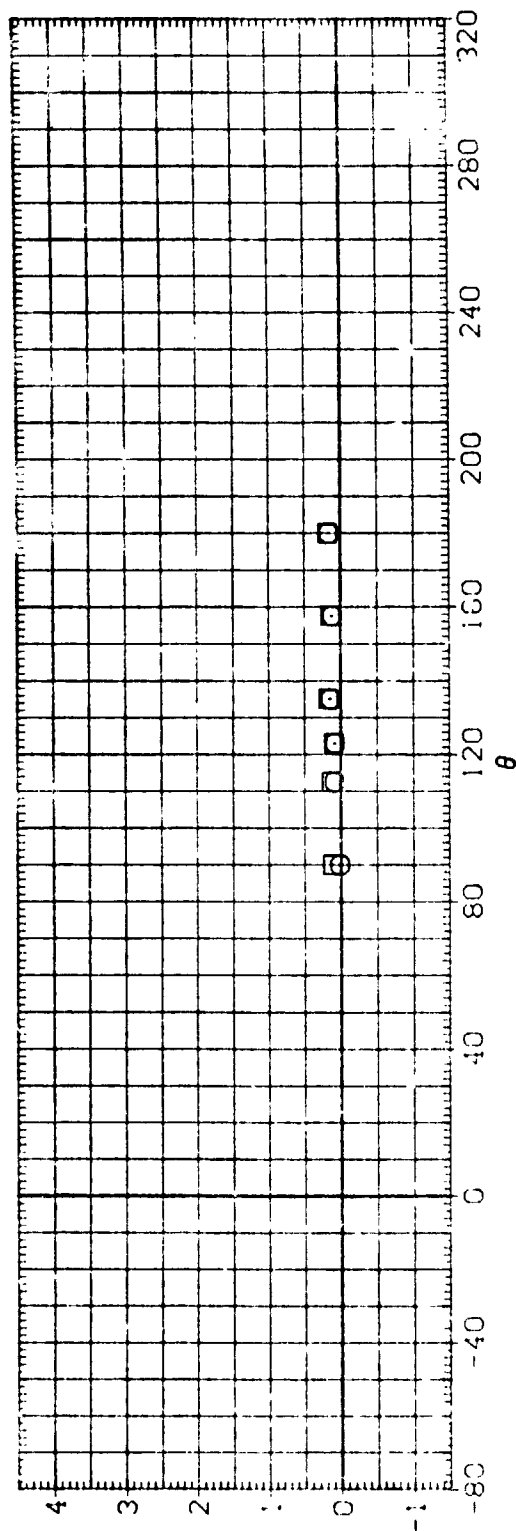


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ .000 .350 2.950
 □ .000 .300

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

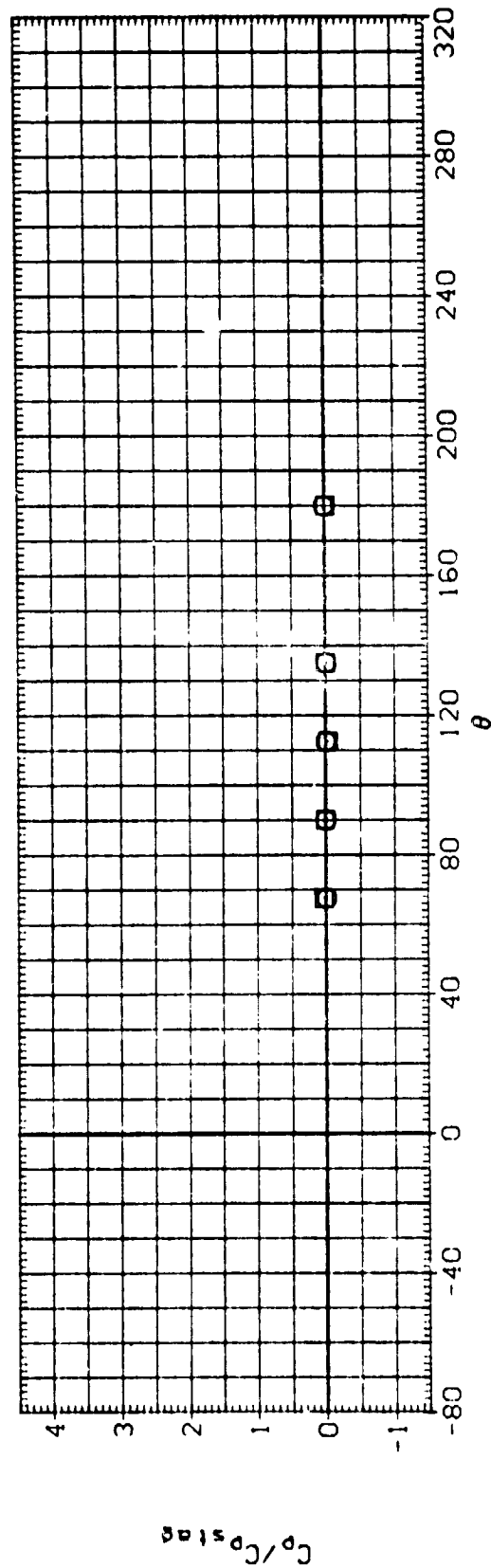
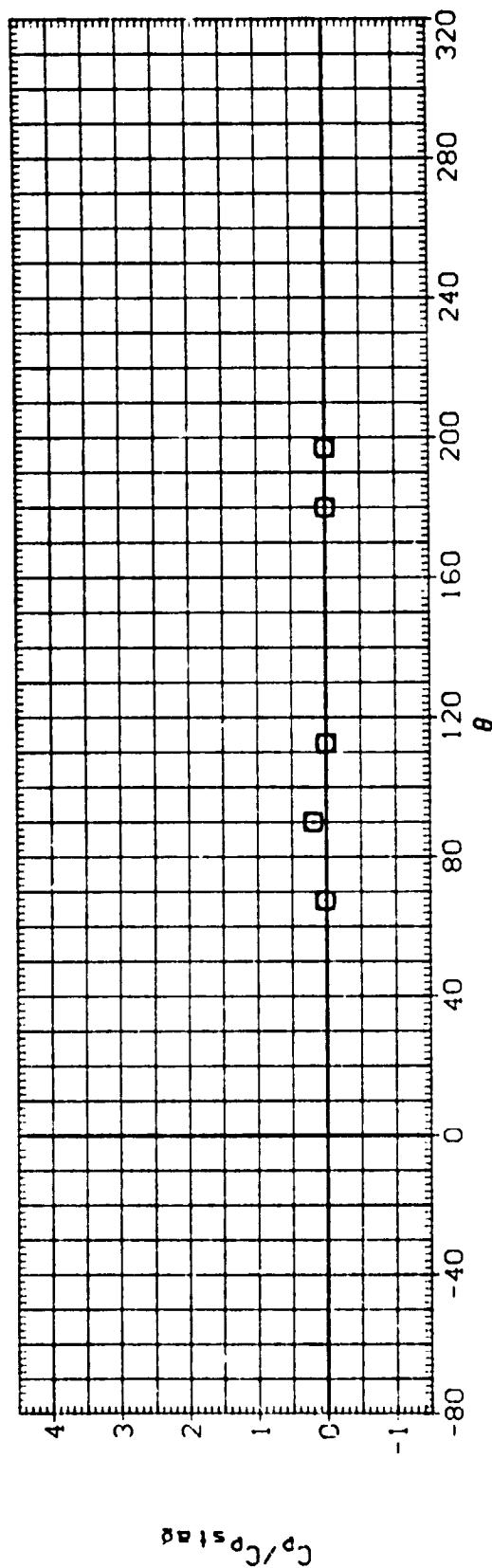


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ .000 .500 2.950
 .000 .400

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

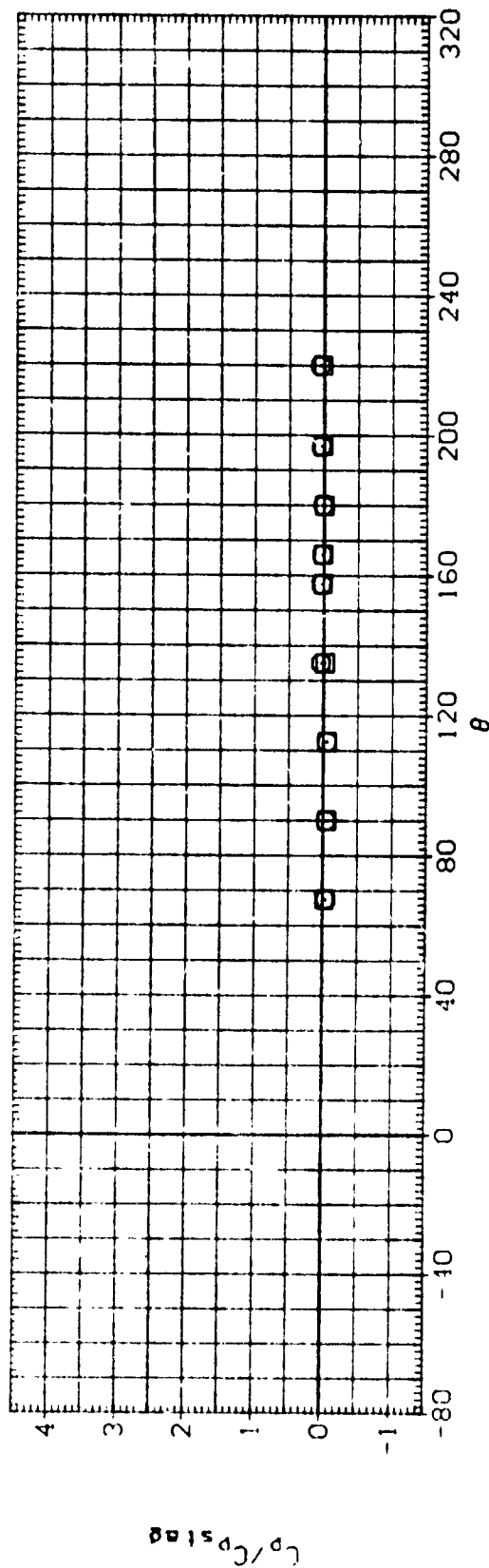
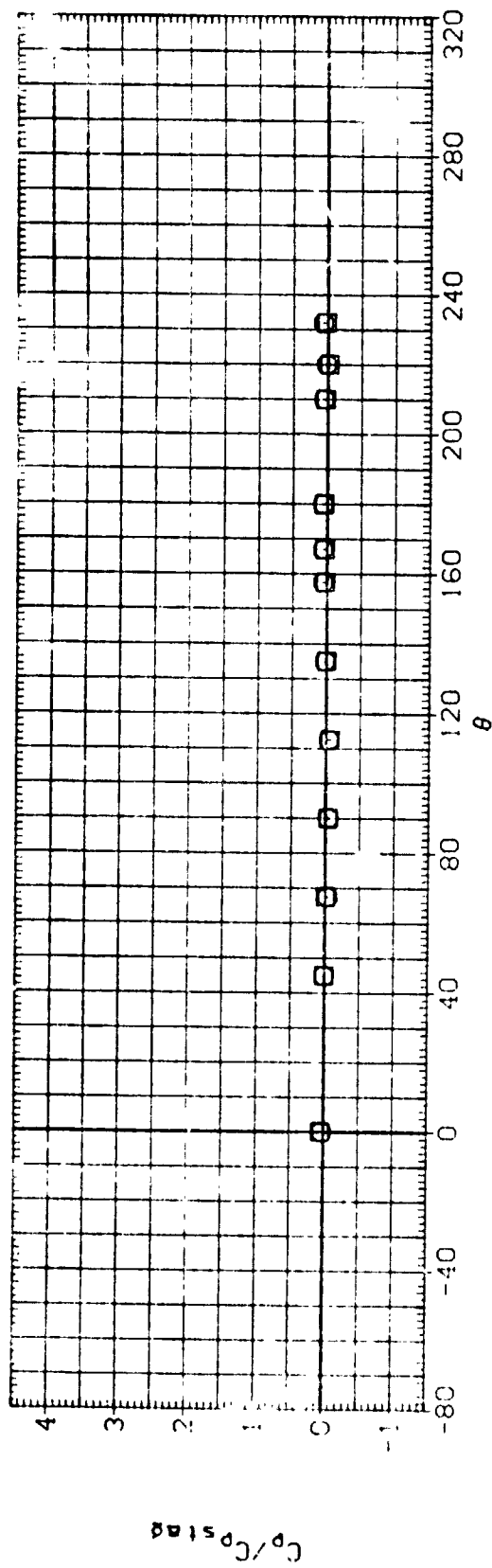


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA
8 .000
5.000

X/L T MACH
.600 2.950
.550

RN/L

PARAMETRIC VALUES
1.200 BETA

.000

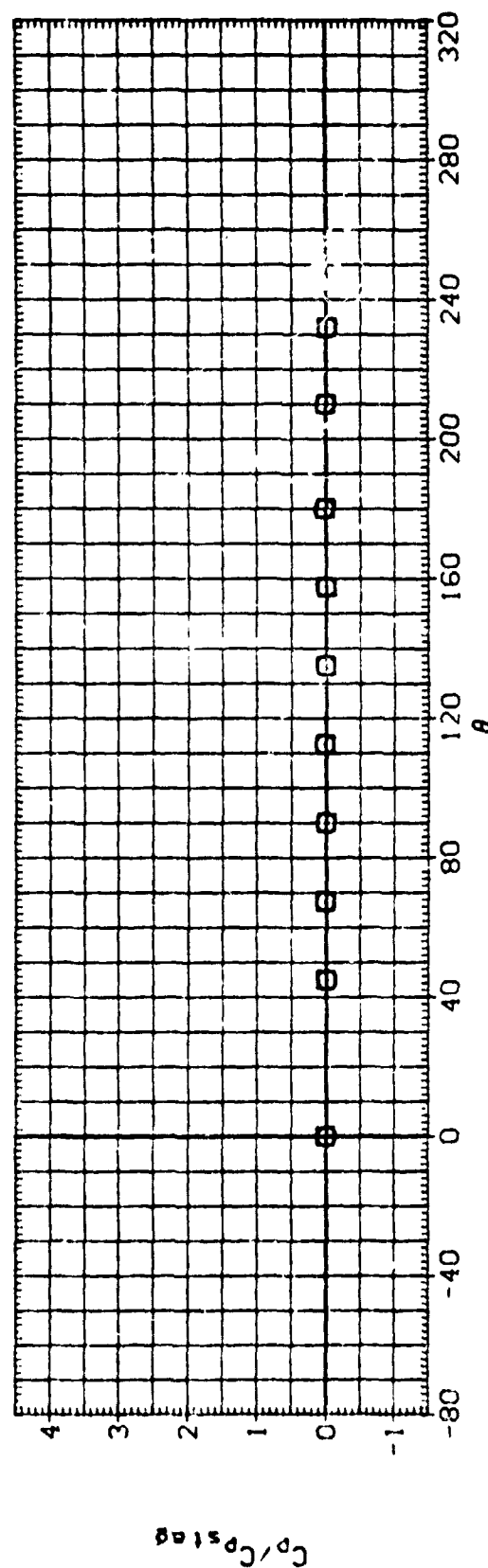
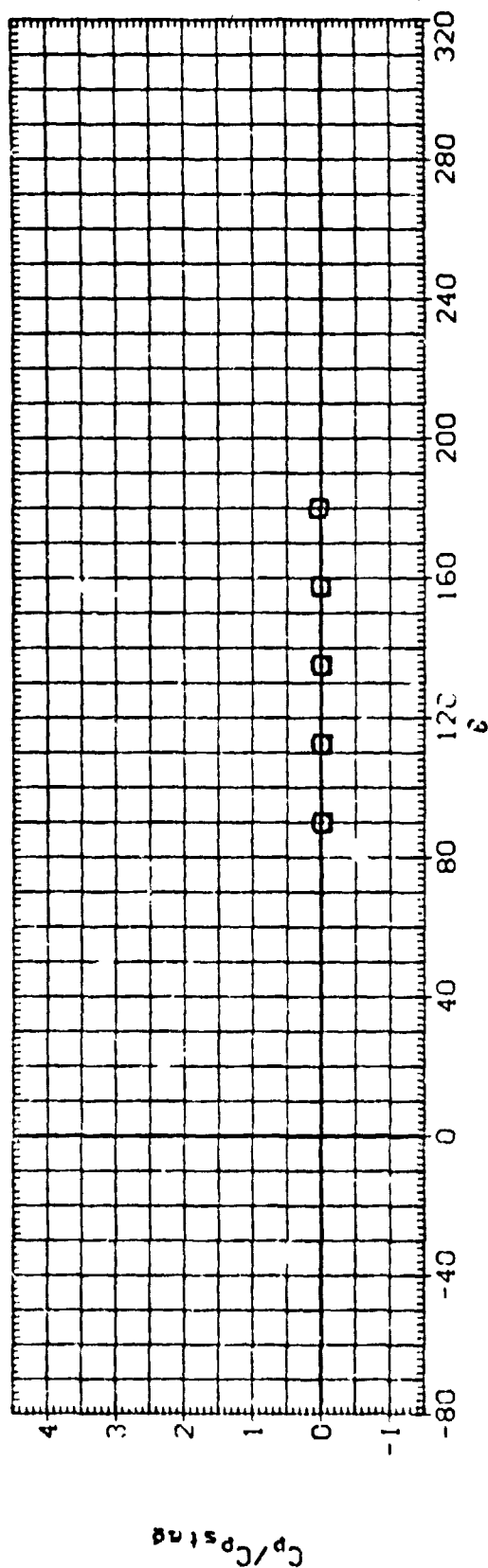


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(RG3TAA) UPWT 1059 (IN4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA
 .000
 .000

X/LT MACH
 .700 2.950
 .650

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

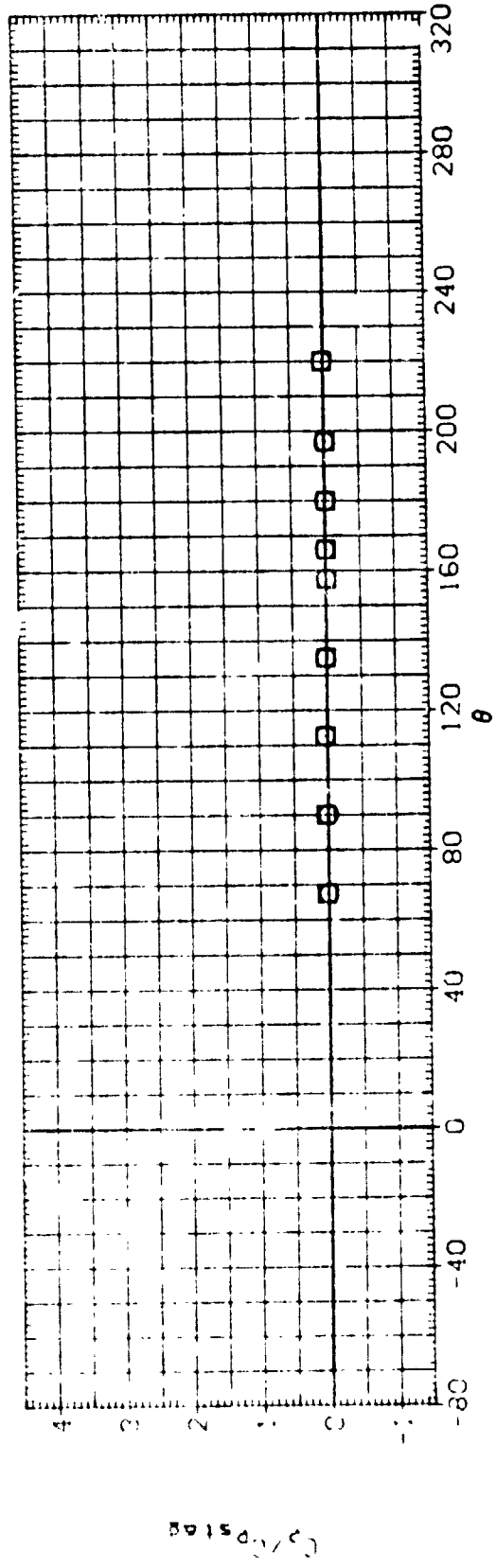
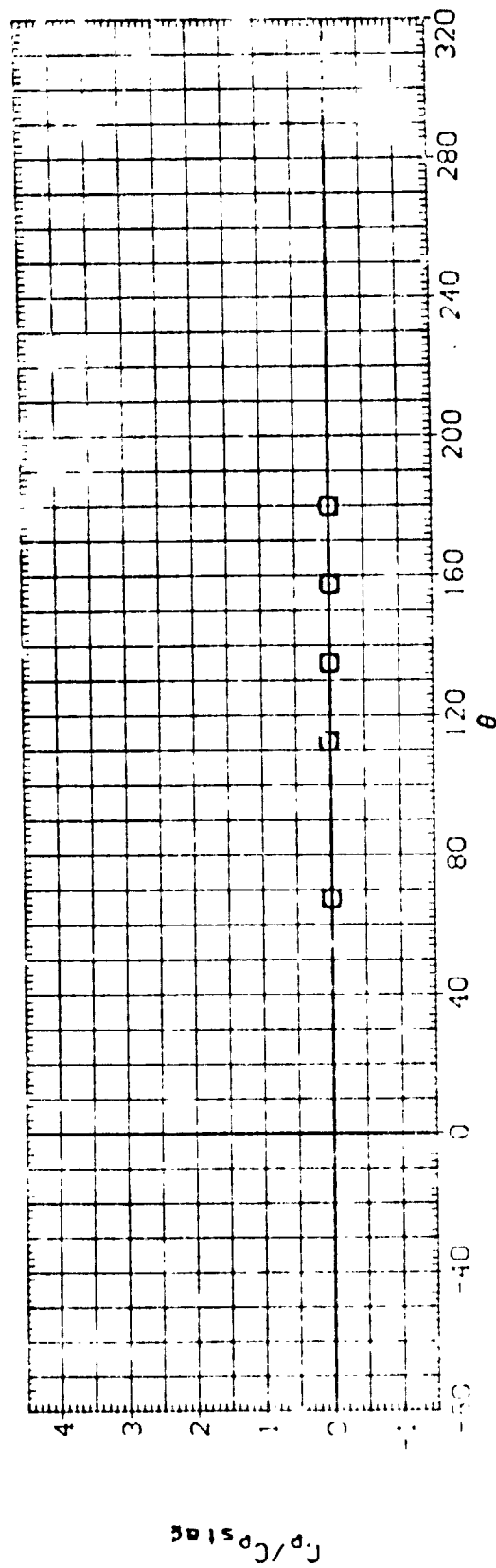


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT HACH
 0 .000 .800 2.950
 1 .000 .750

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

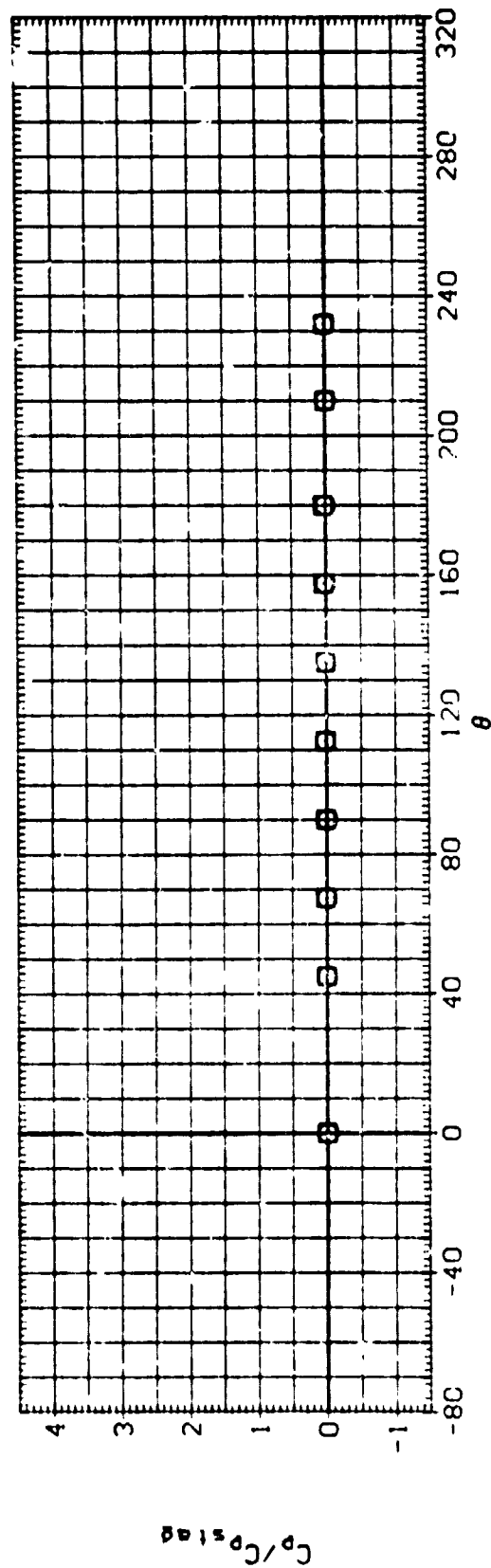
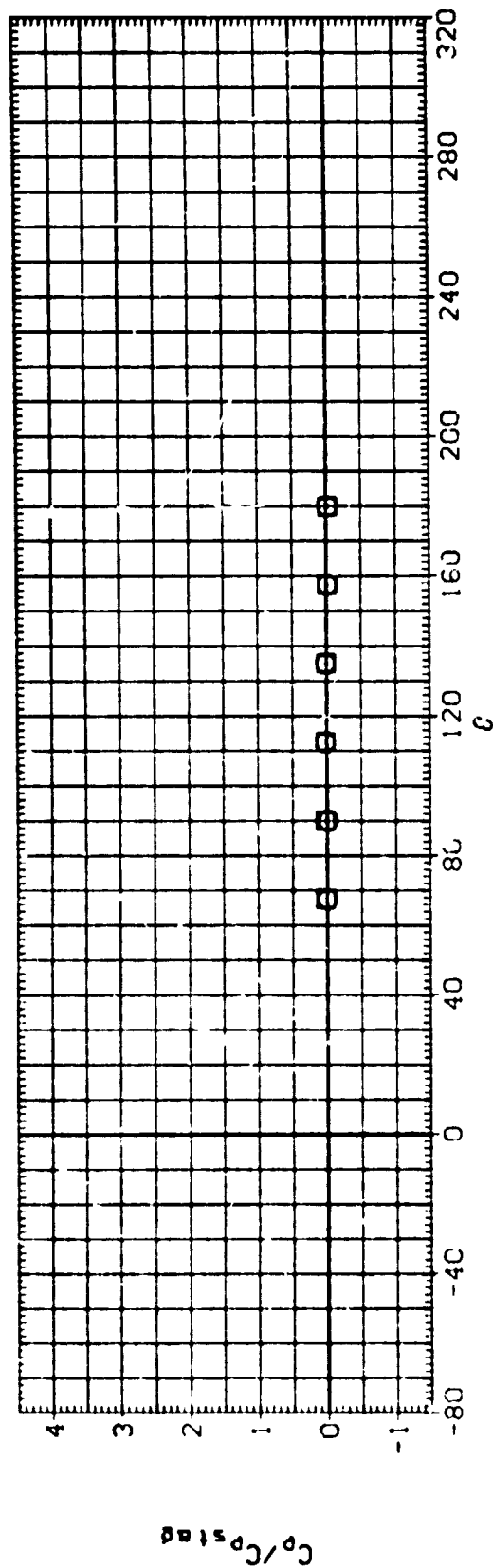


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPH K/LT WACH
 .000 .900 2.950
 5.000 .850

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

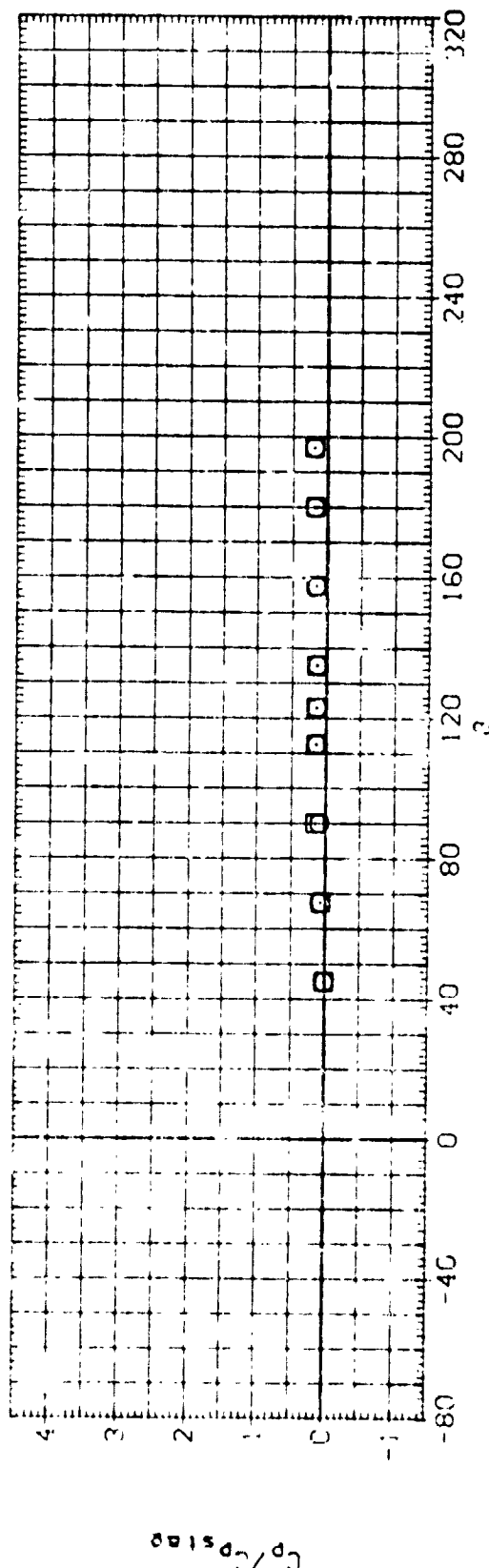
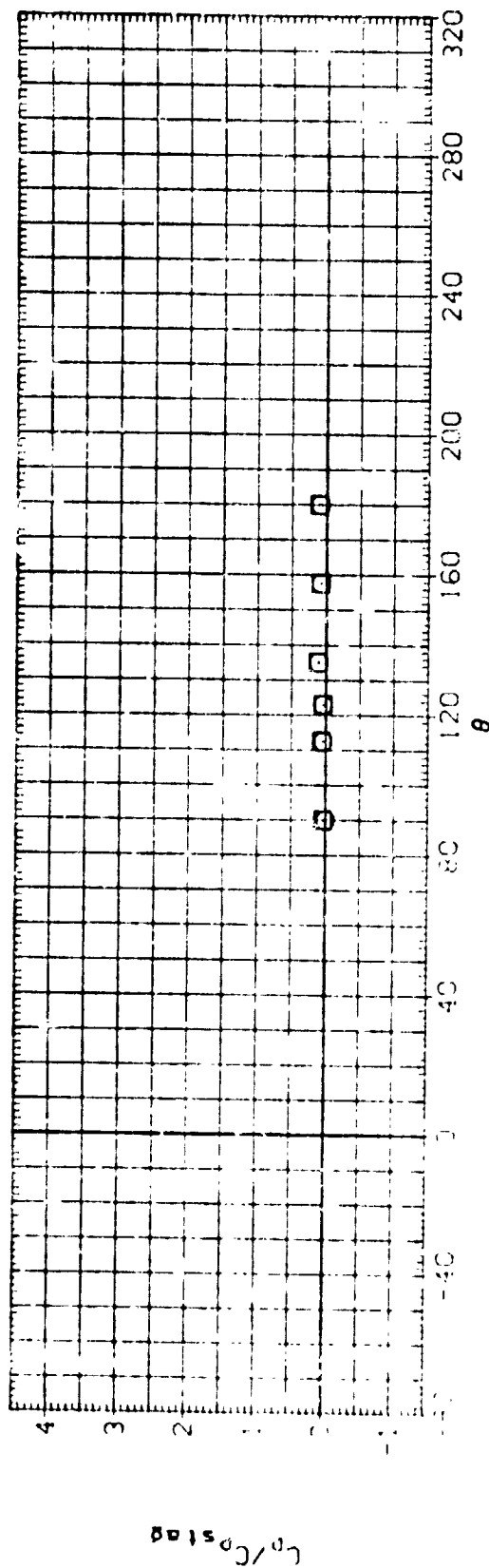


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK, BETA = 0. $RN/L = 1.2$

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA

-5.000

.000

X/LT

.350

.300

MACH

3.700

.000

RN/L

1.200

BETA

.000

PARAMETRIC VALUES

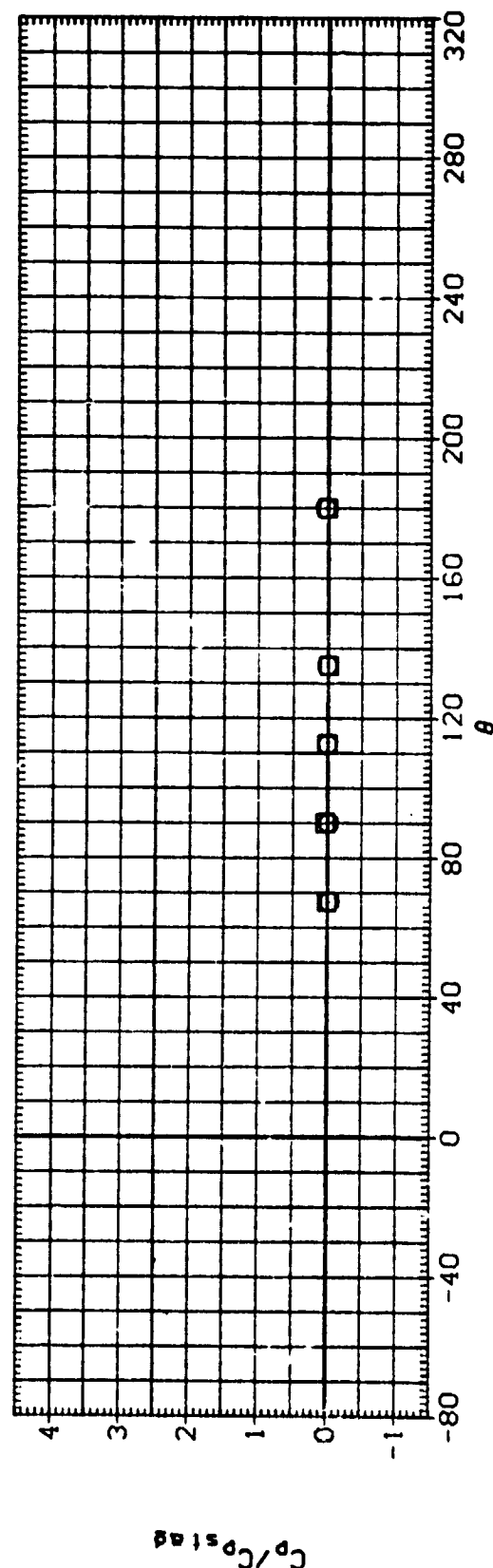
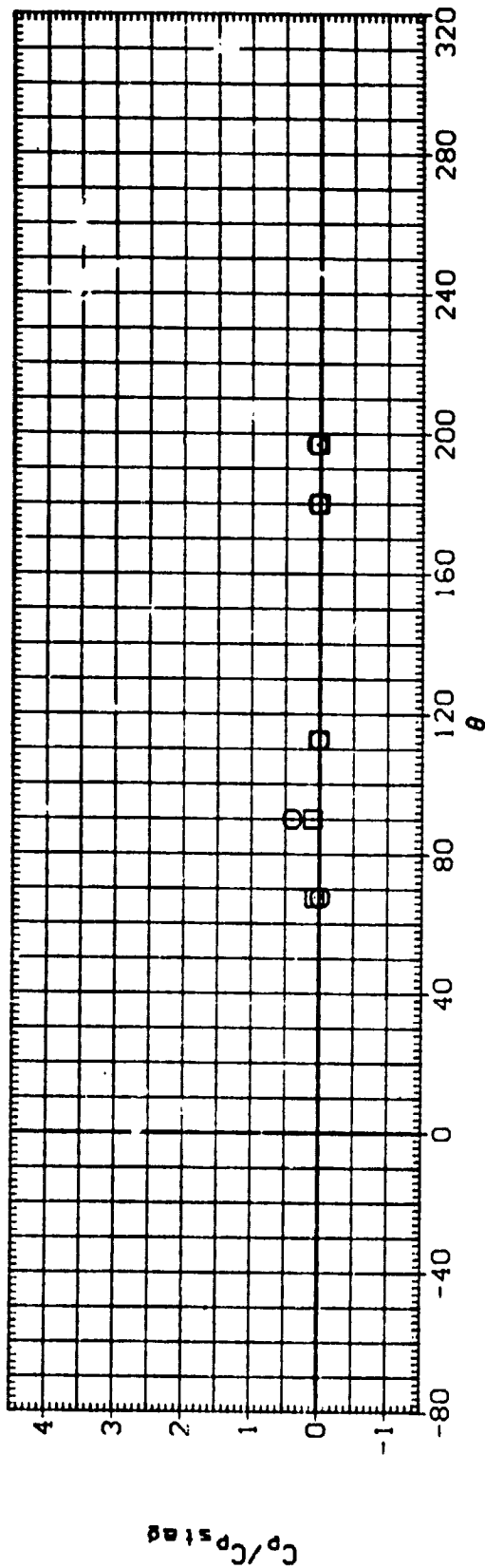


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ -5.000 .500 3.700
 □ .000 .400

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

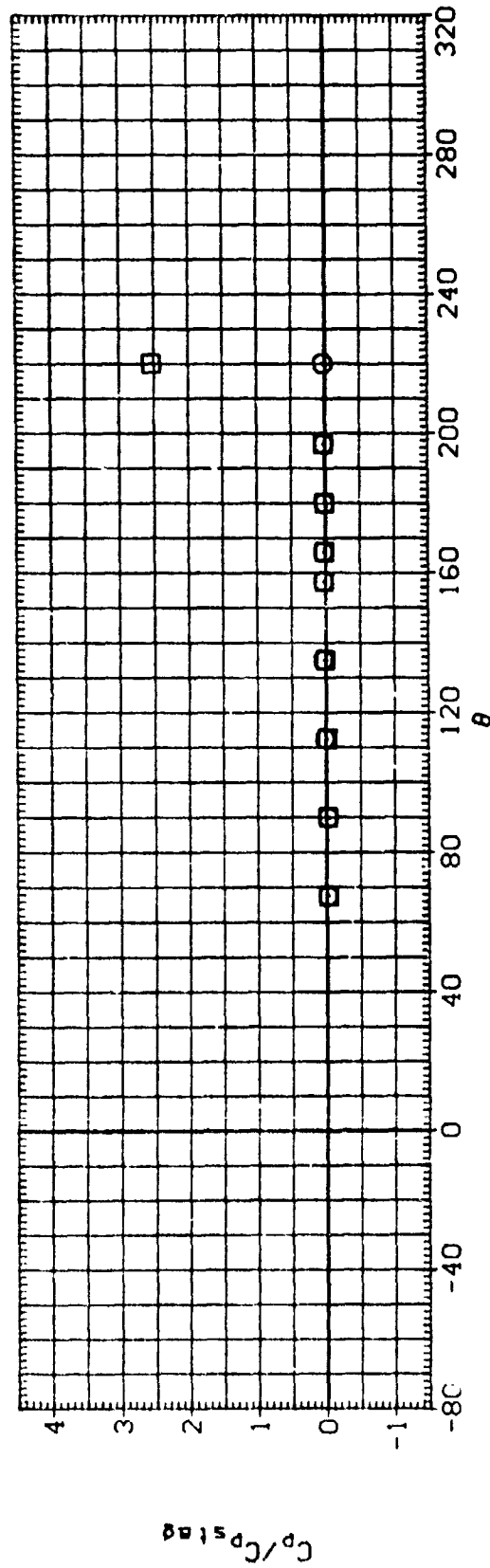
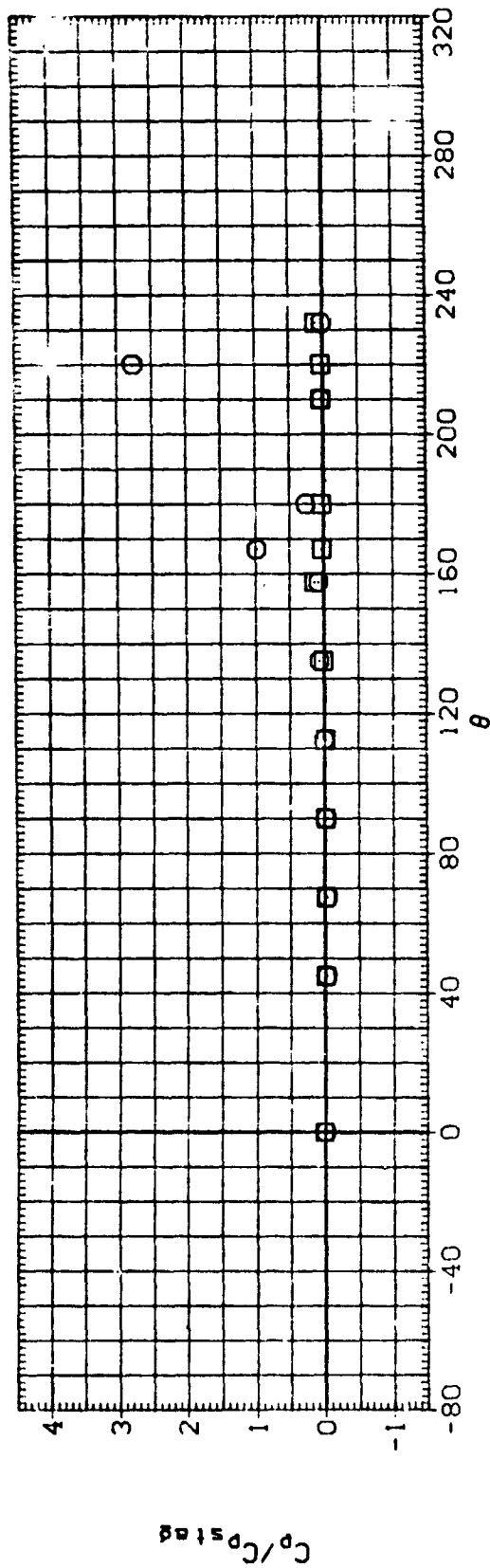


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 B -5.000 .600 3.700
 .000 .550

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

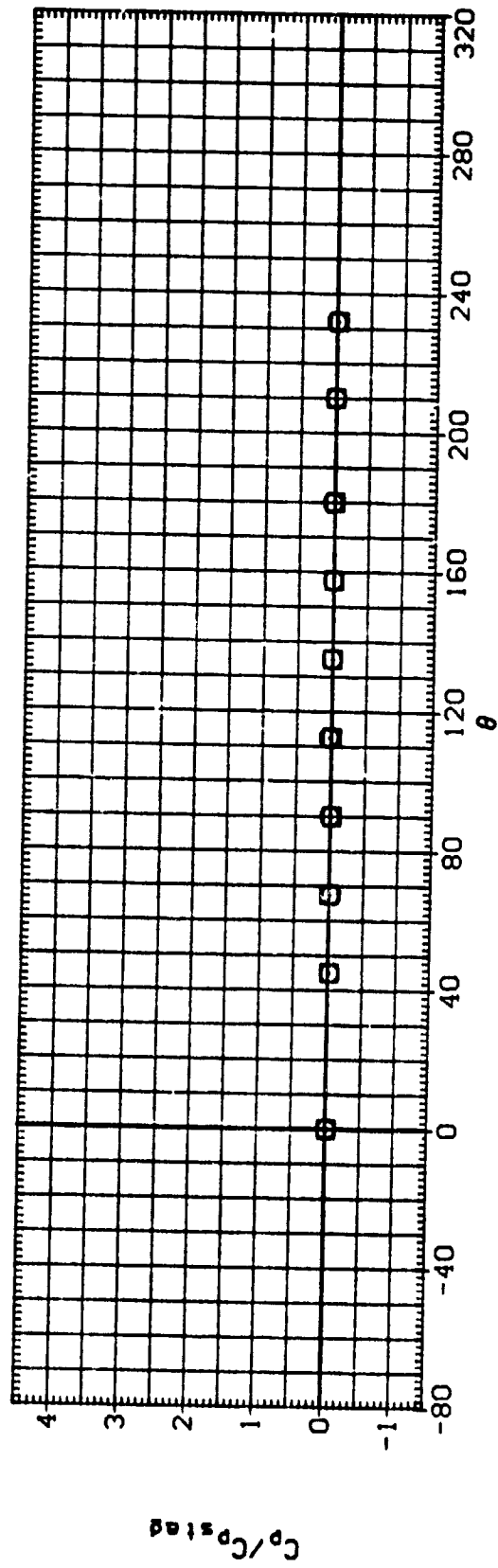
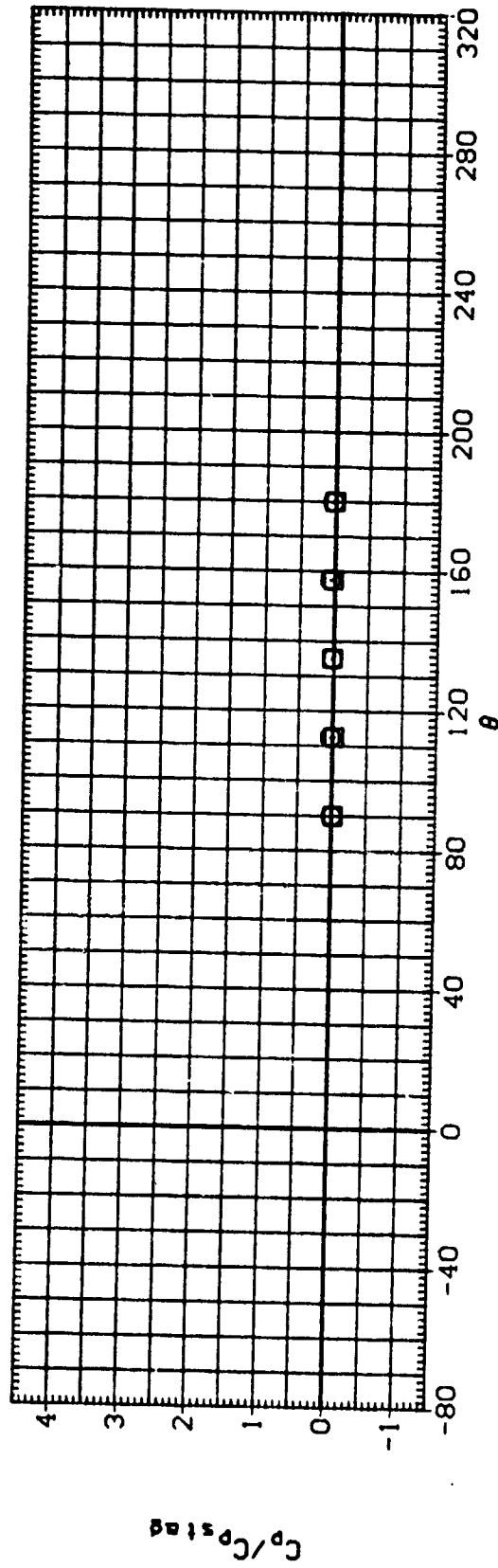


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
RN/L 1.200 BETA .000

SYMBOL ALPHA X/LT MACH
-5.000 .700 5.700
□ .650

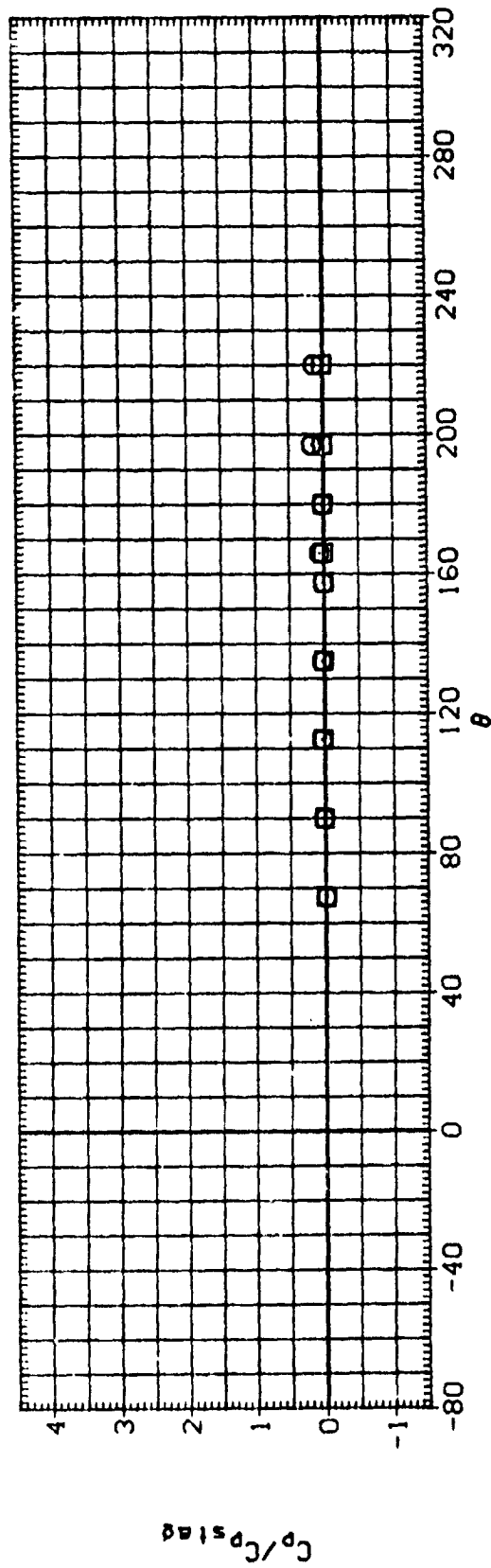
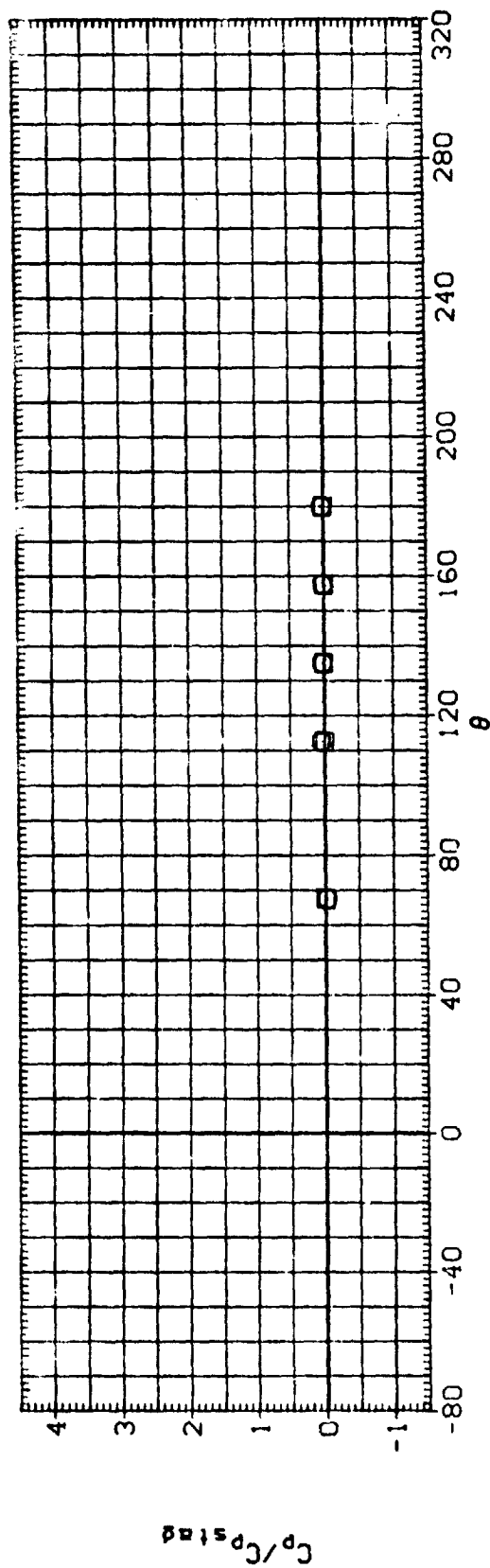
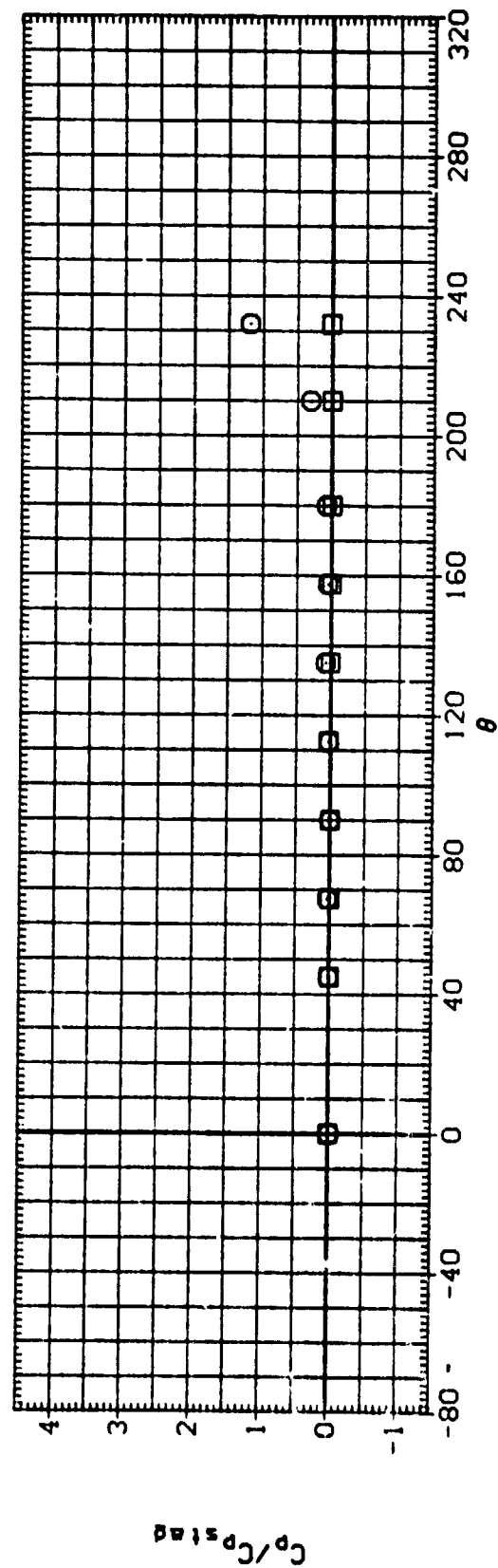
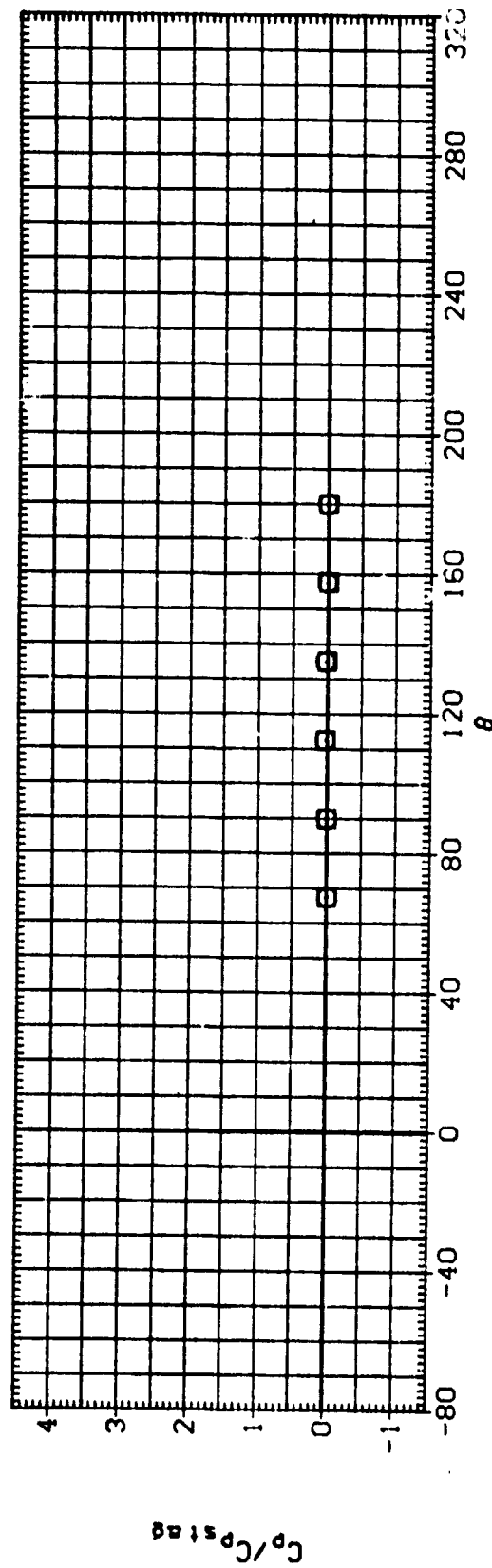


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ -5.000 .800 3.700

PARAMETRIC VALUES
 RN/L 1.200 BETA .000



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FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -5.000 .900 3.700
 .000 .850

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

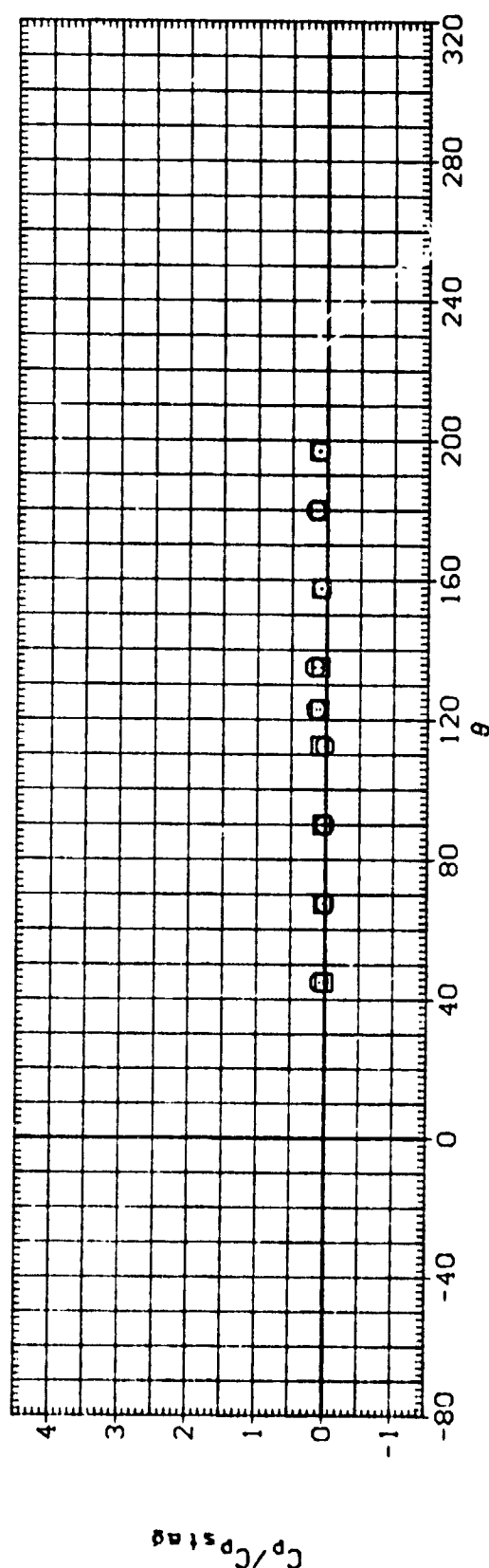
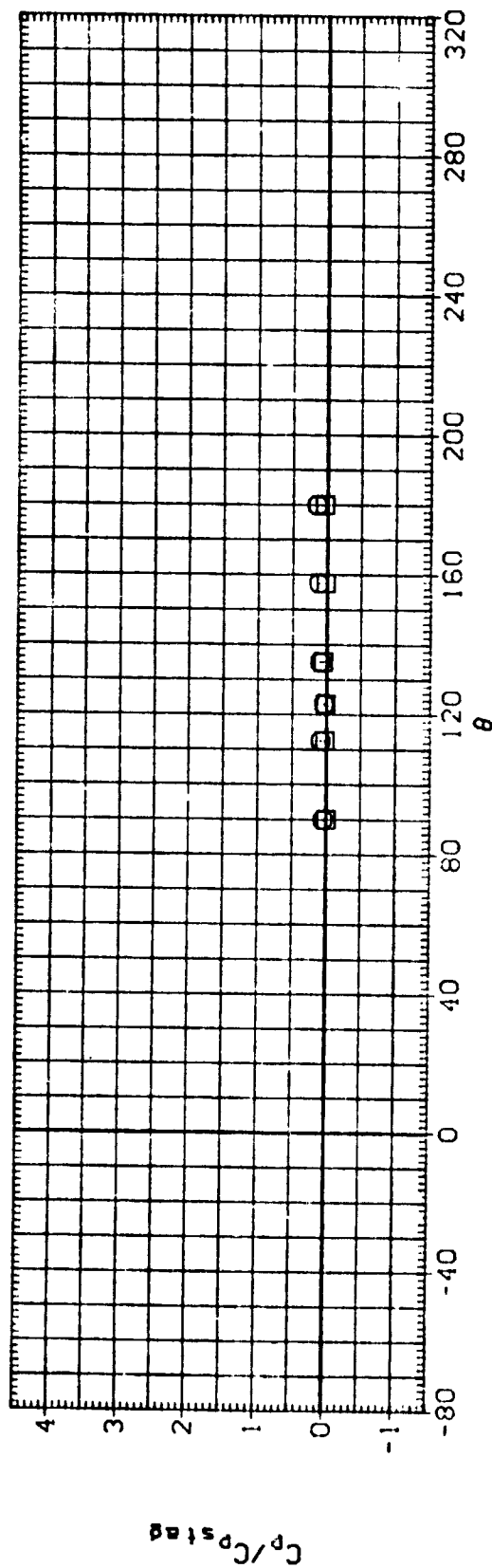


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 B -5.000 .350 4.500
 .000 .300

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

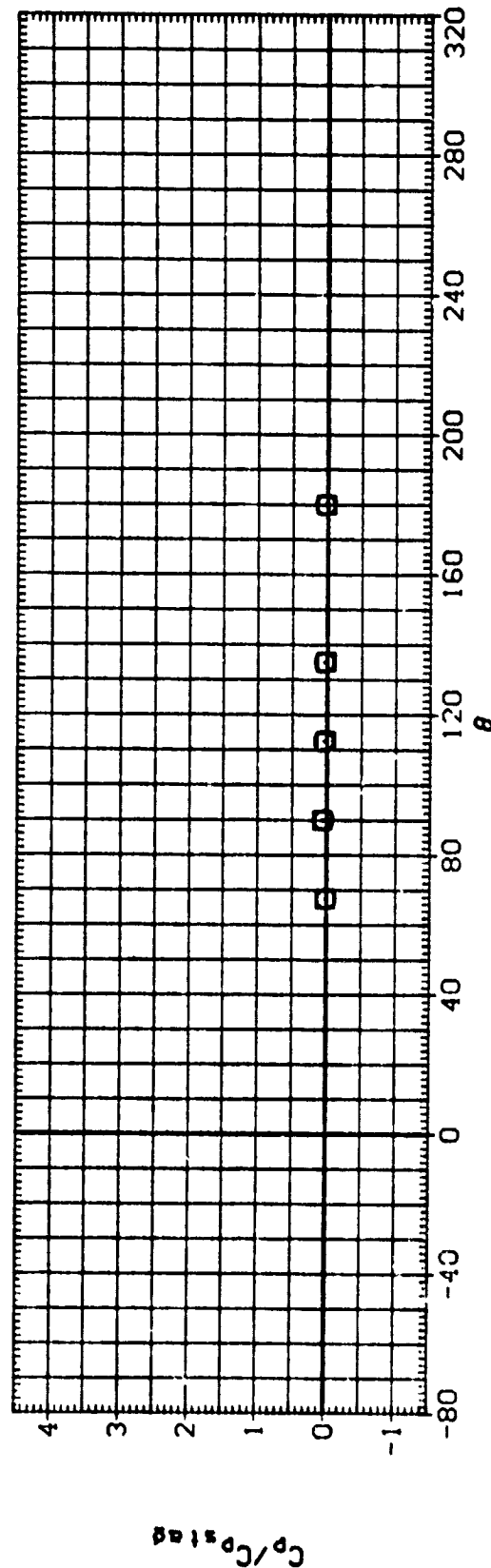
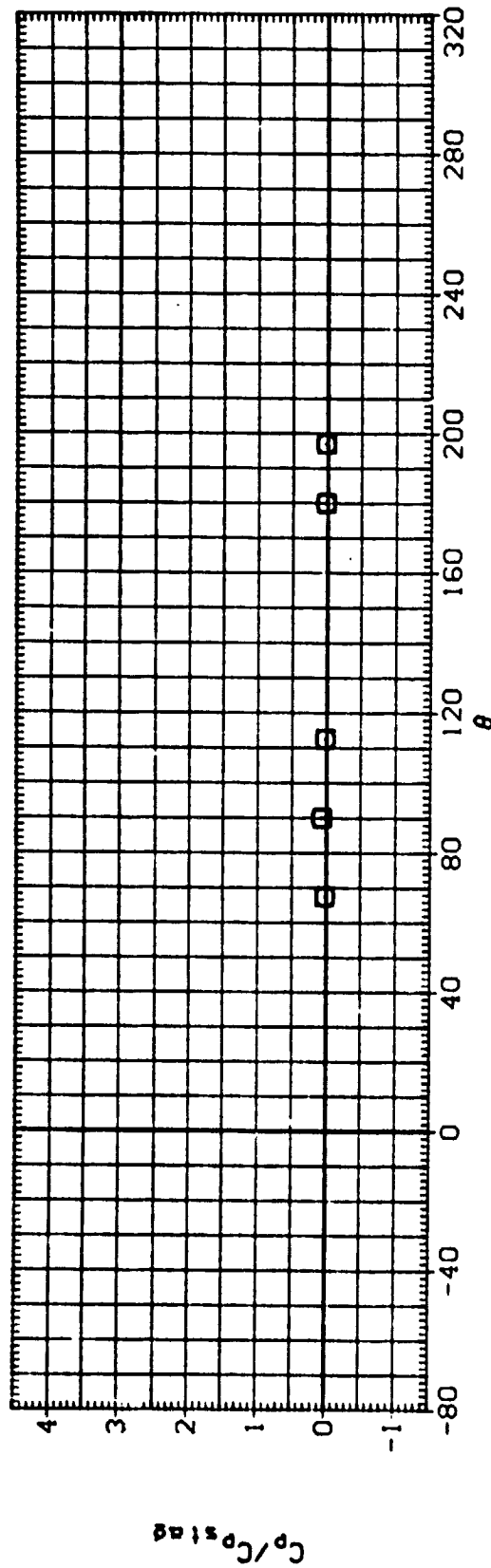


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

[R03TAA] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -5.000 .500 4.500
 .000 .400

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

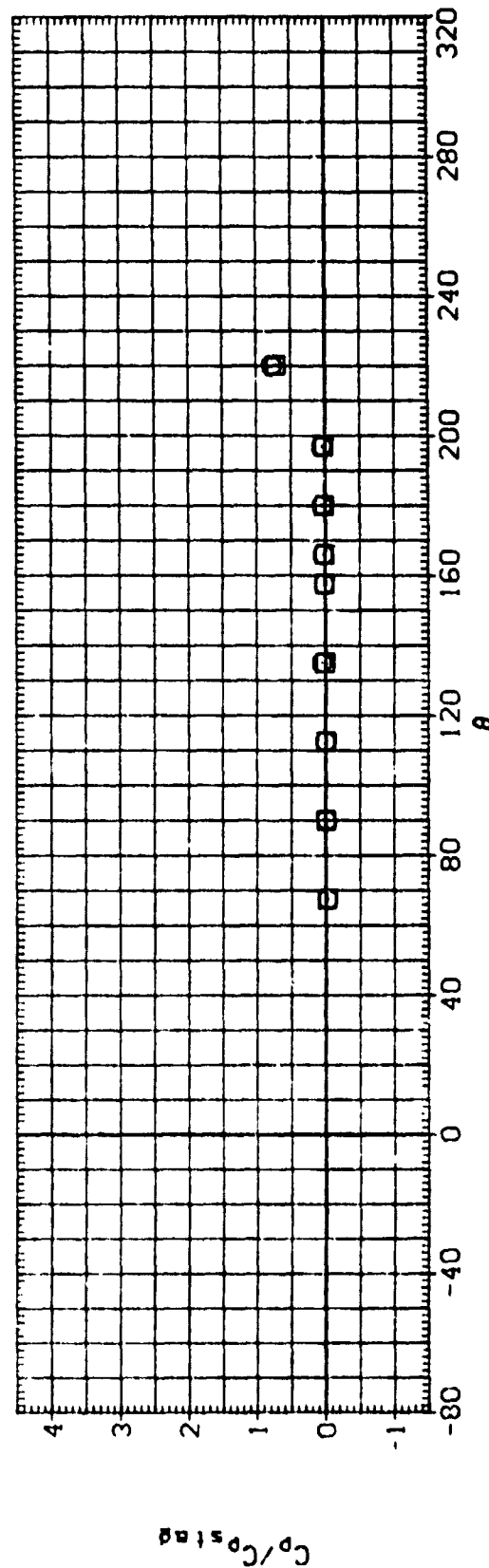
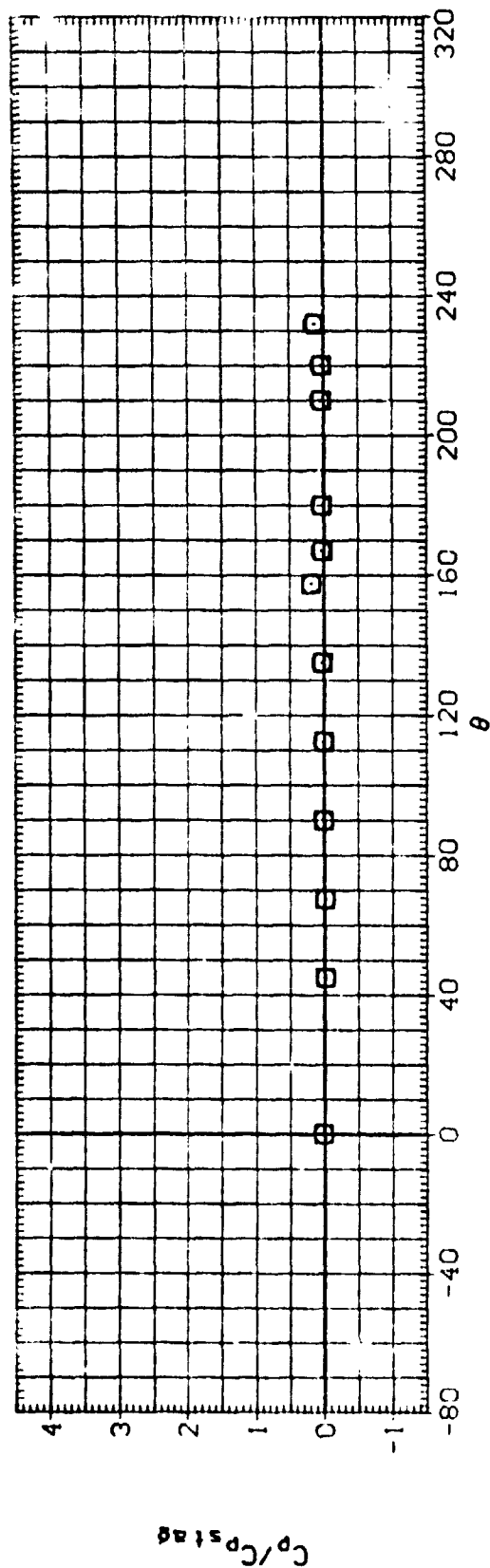


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

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(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -5.000 .500 4.500
 .000 .550

PARAMETRIC VALUES
 1.200 BETA .000

RN/L

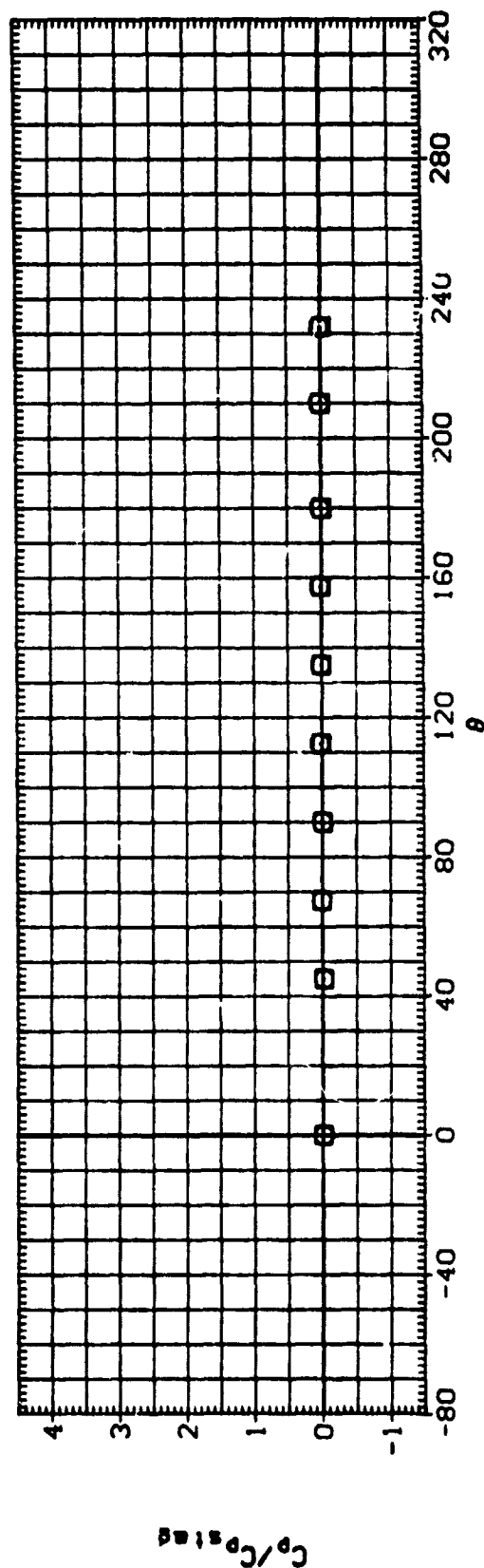
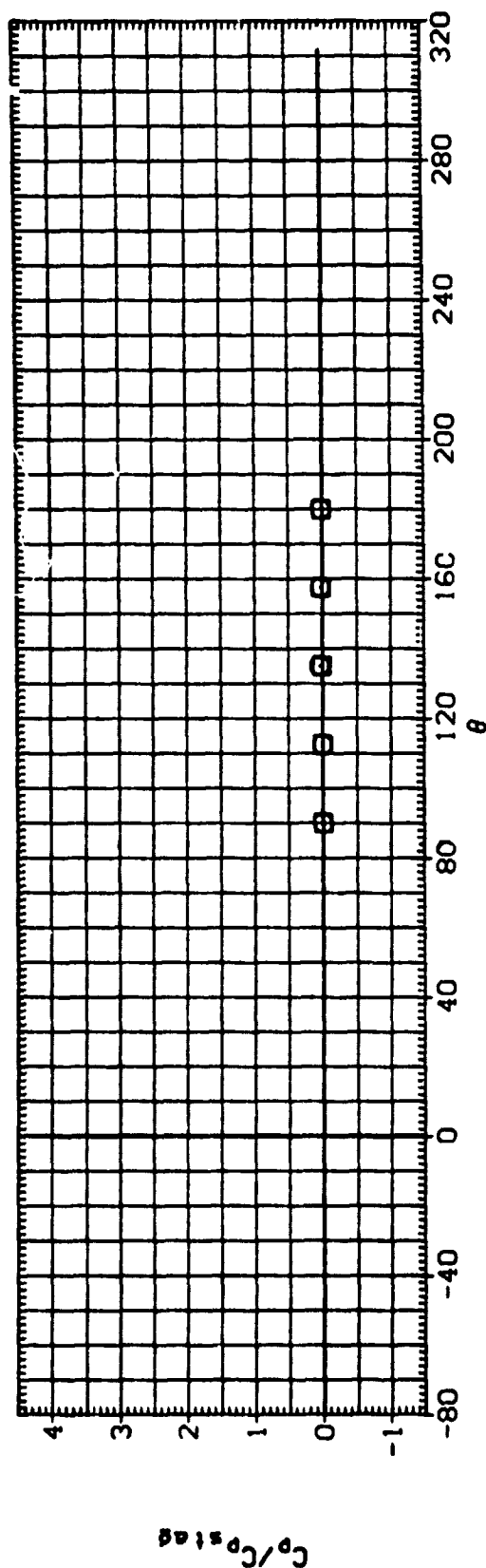


FIG. 14 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T'S. EXTERNAL TANK, BETA= 0. RN/L= 1.2

(RQ3TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.700	4.600		1.200 BETA .000
	.000	.650			

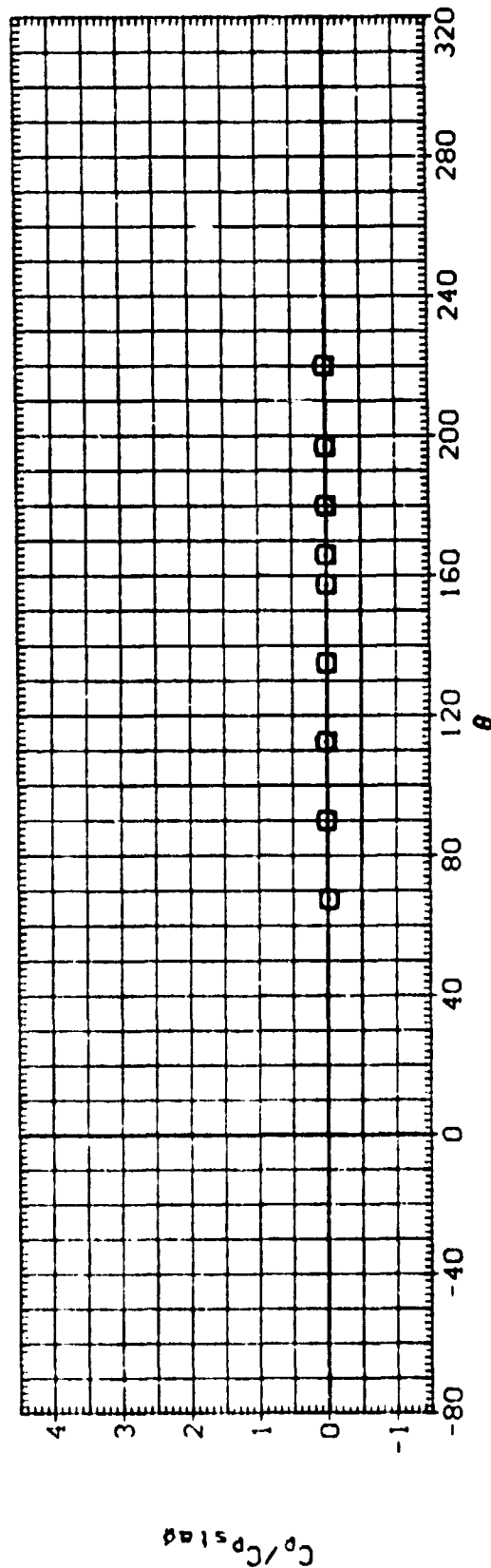
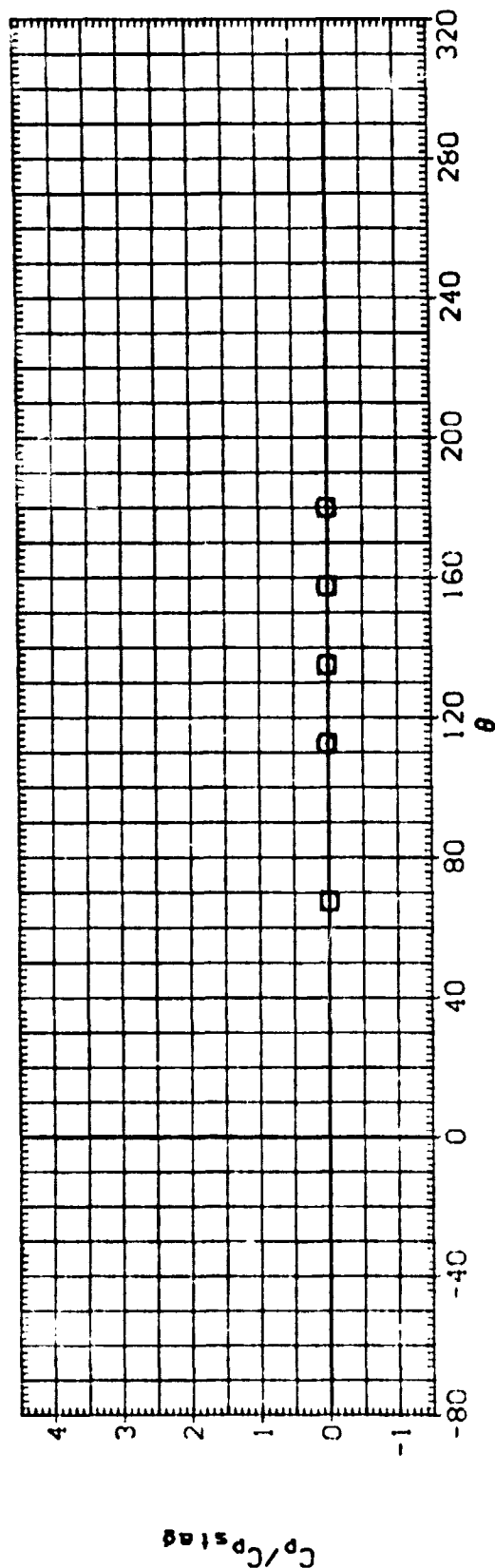


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ -5.000 .800 4.600
 .000 .750

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

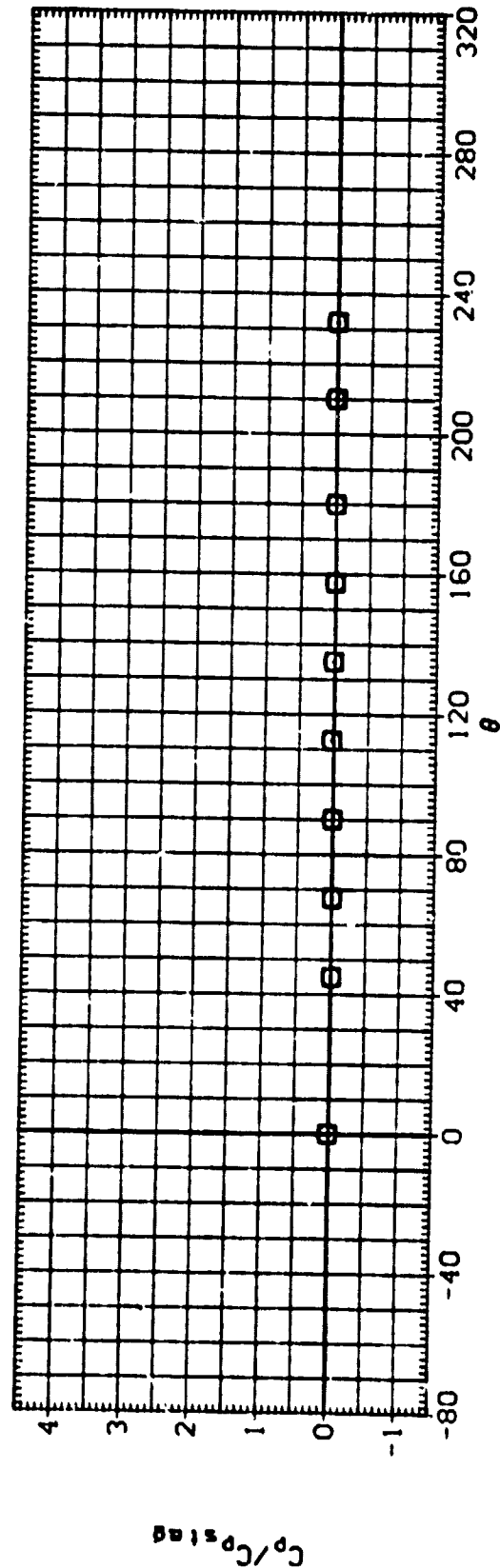
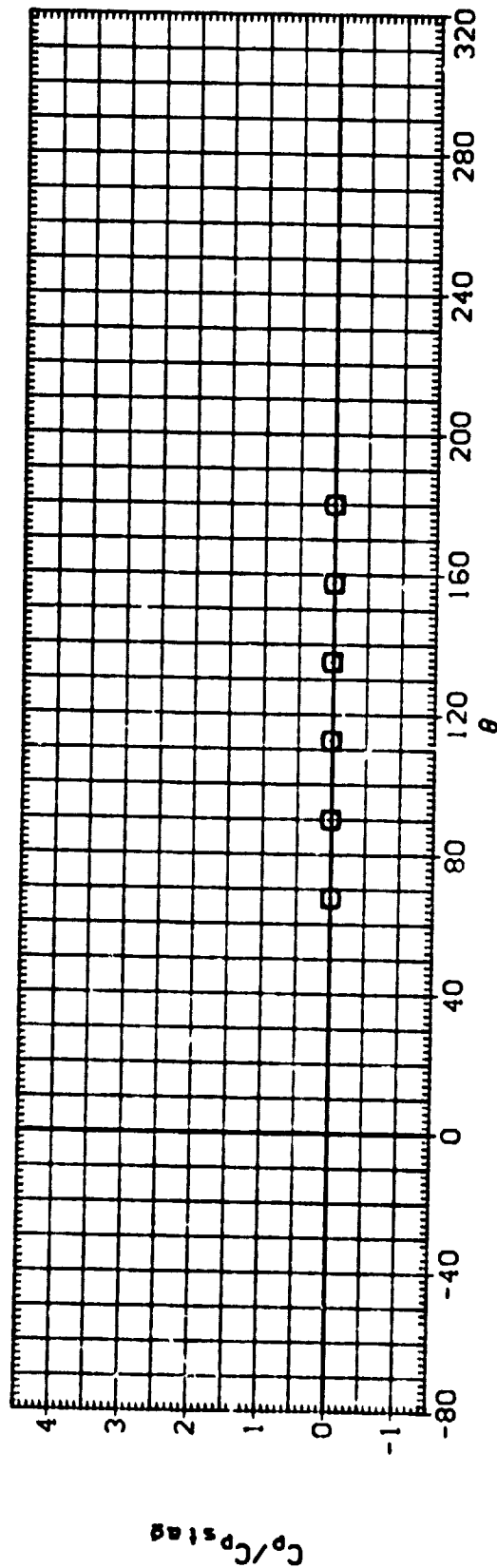


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 1.2

(R03TAA) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA

-5.000

.000

K/LT

.900

.850

MACH

4.600

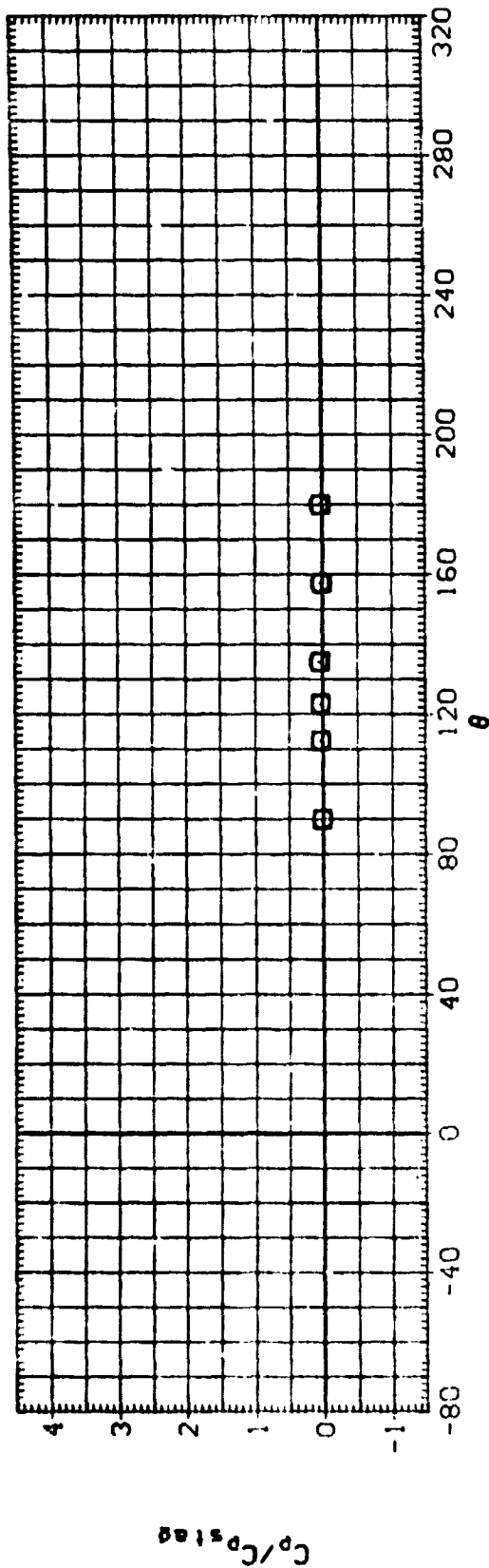
PARAMETRIC VALUES

1.200

BETA

.000

RN/L



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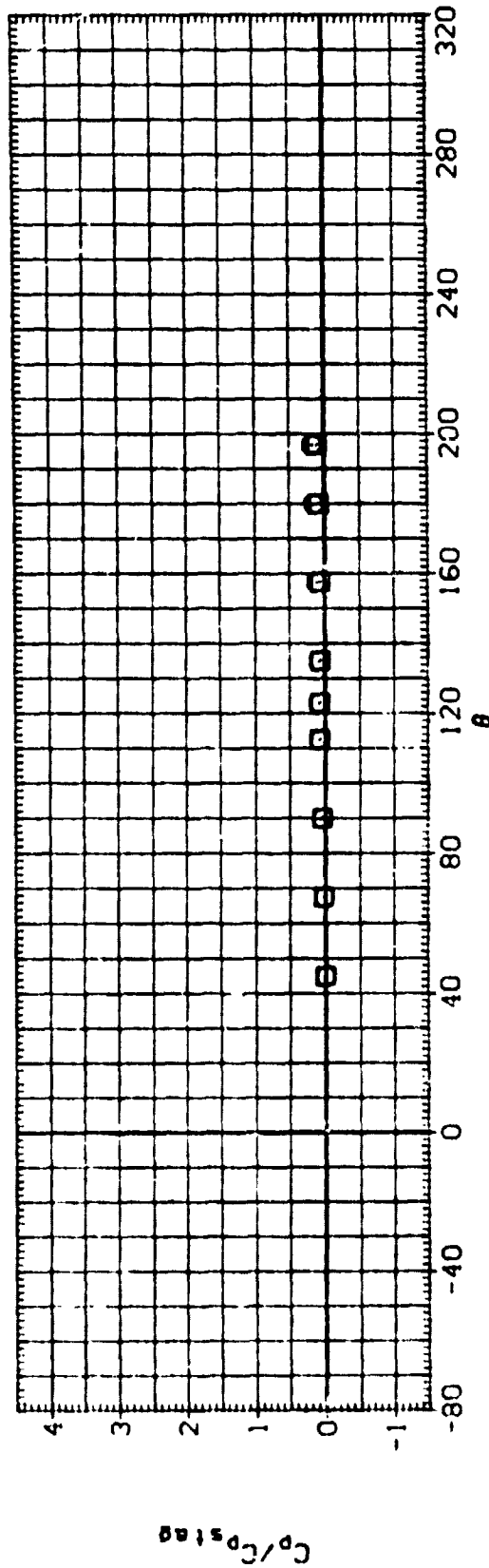


FIG. 14 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 1.2

[R03SAA] UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 0 5.000 180.000 2.360
 1 5.000 90.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .300

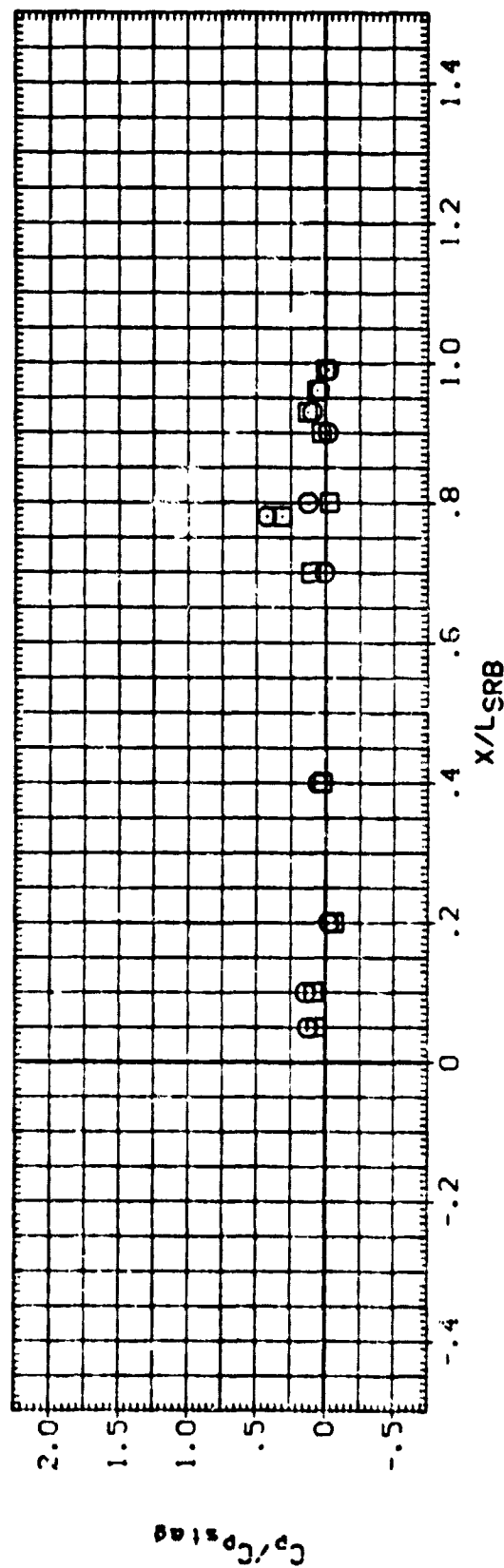
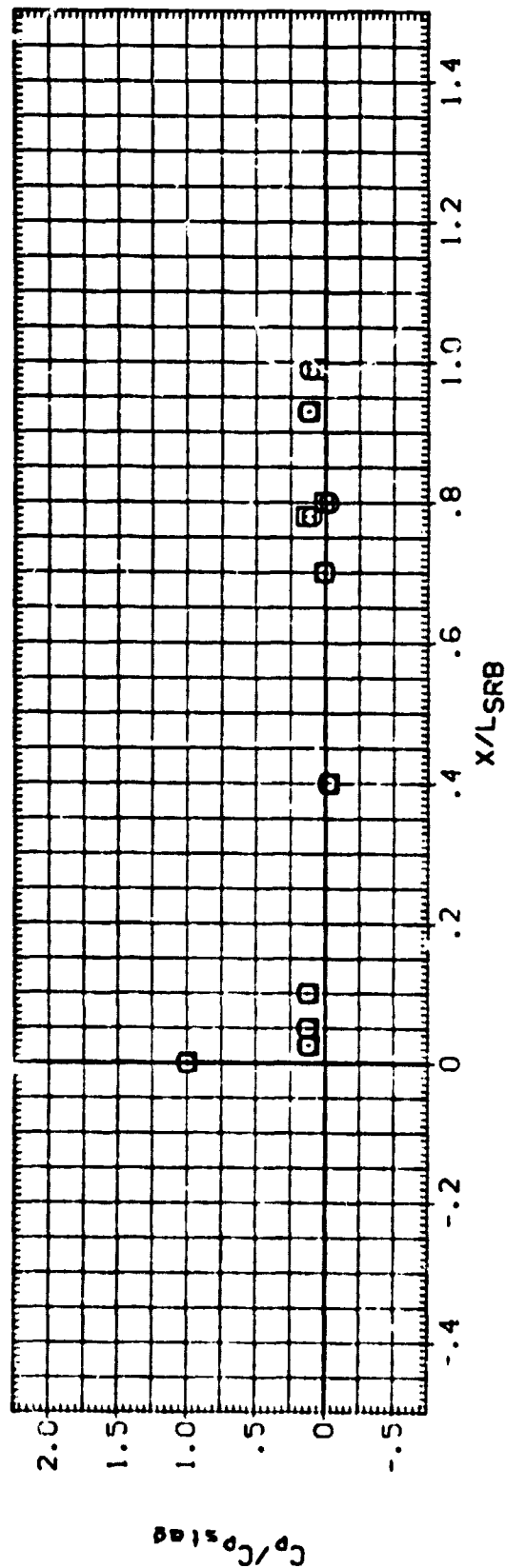


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 5.000 225.000 2.360

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

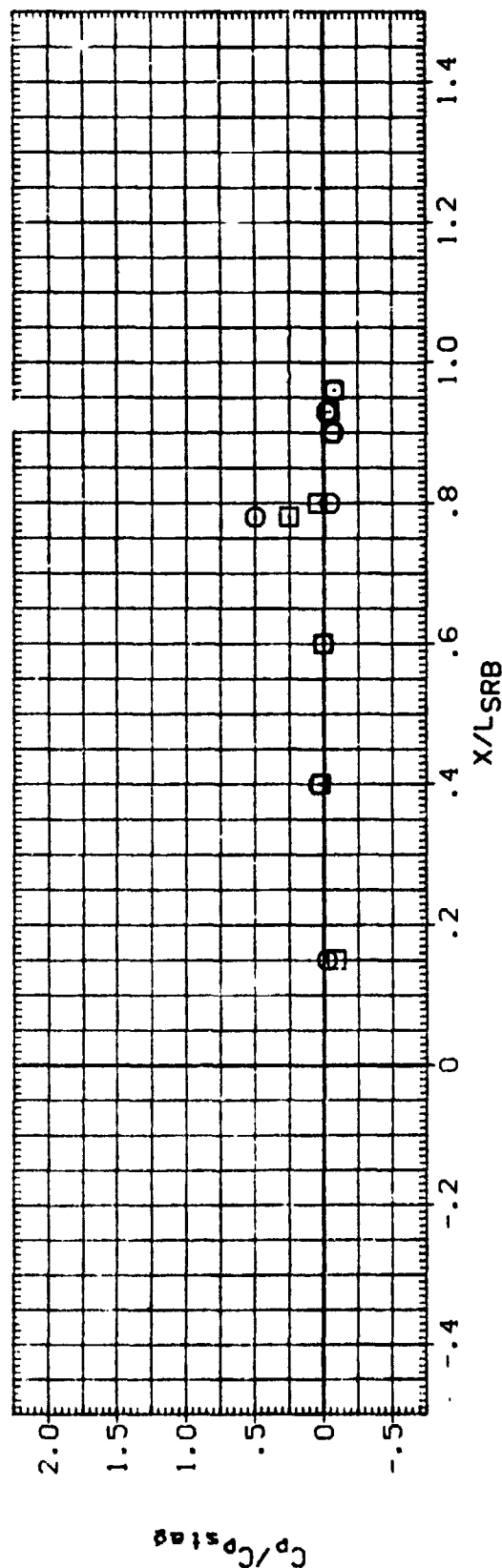
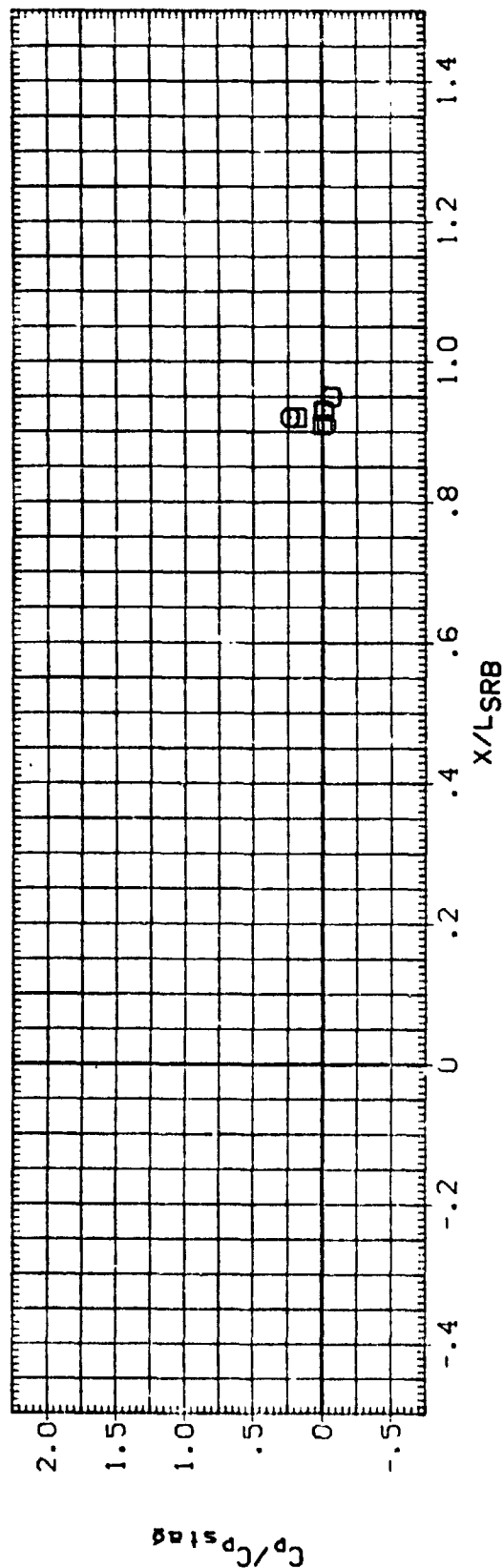


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 □ .000 270.000 2.360
 .000 247.500

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

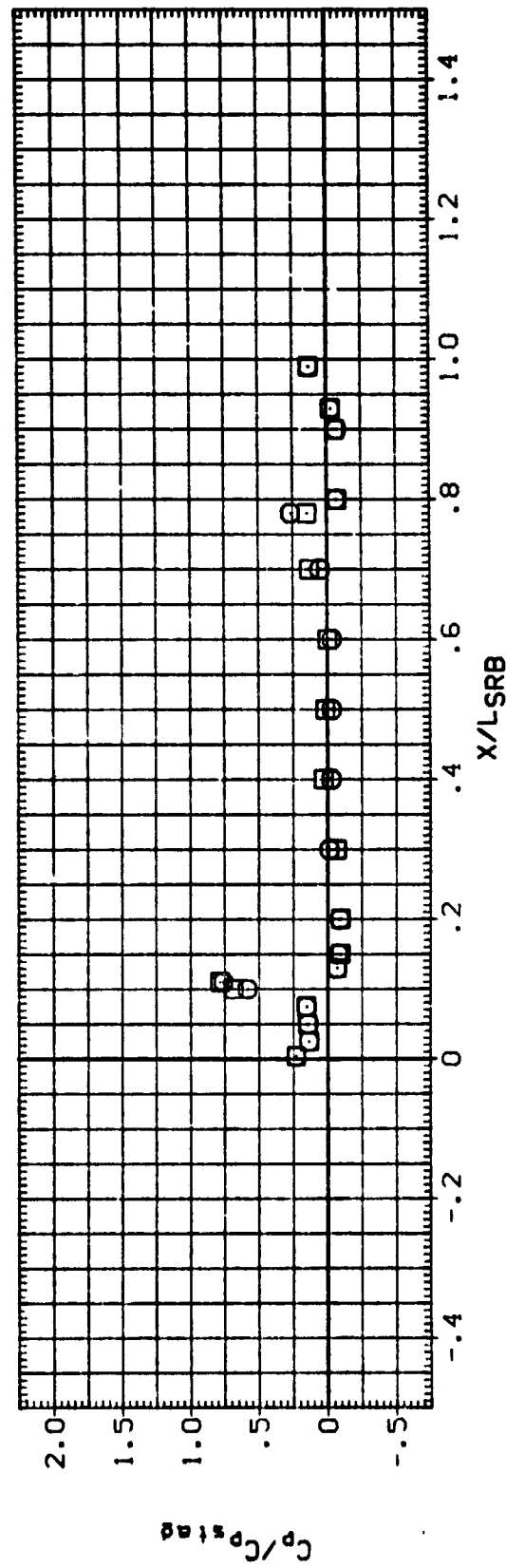
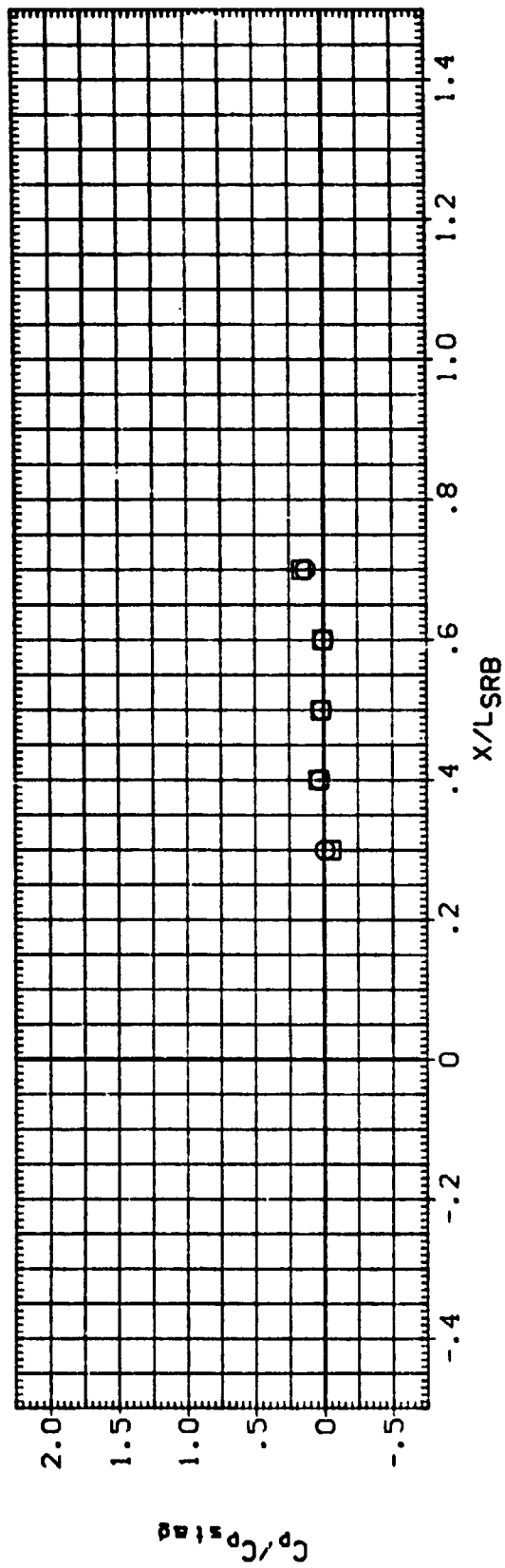


FIG. 15 VARIATION OF C_p/C_{pSRB} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. $\beta = 0.0$. $RN/L = 1.2$

[RQ3SAA] UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 □ .000 180.000 2.950
 □ 5.000 90.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

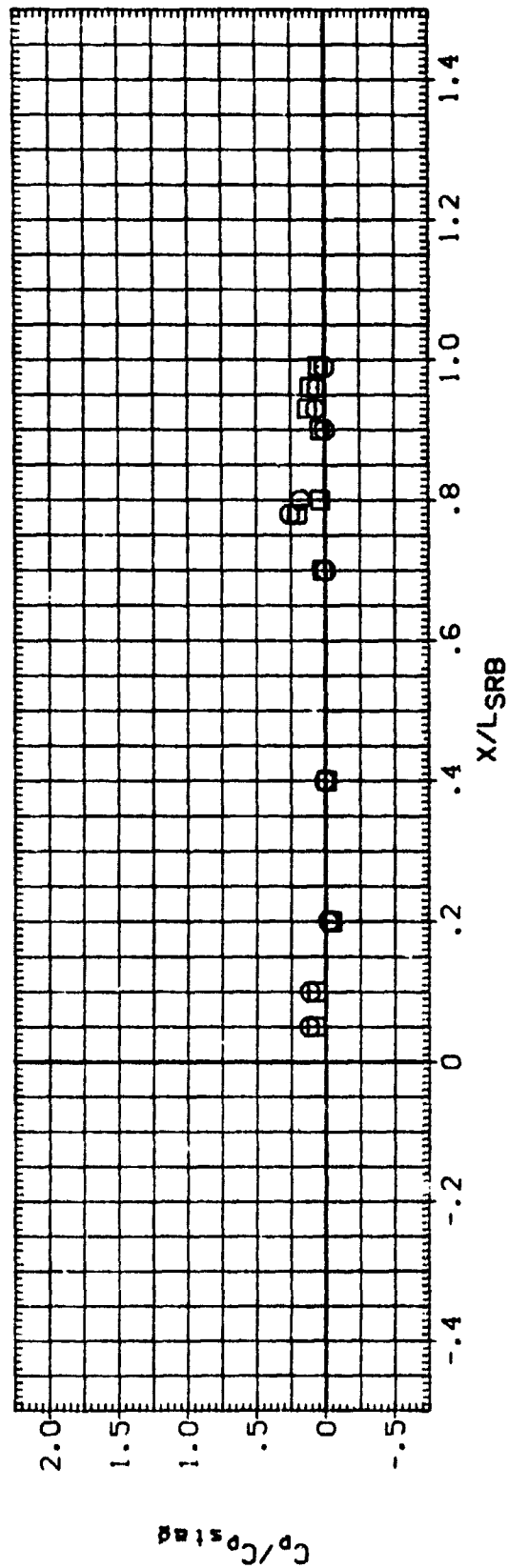
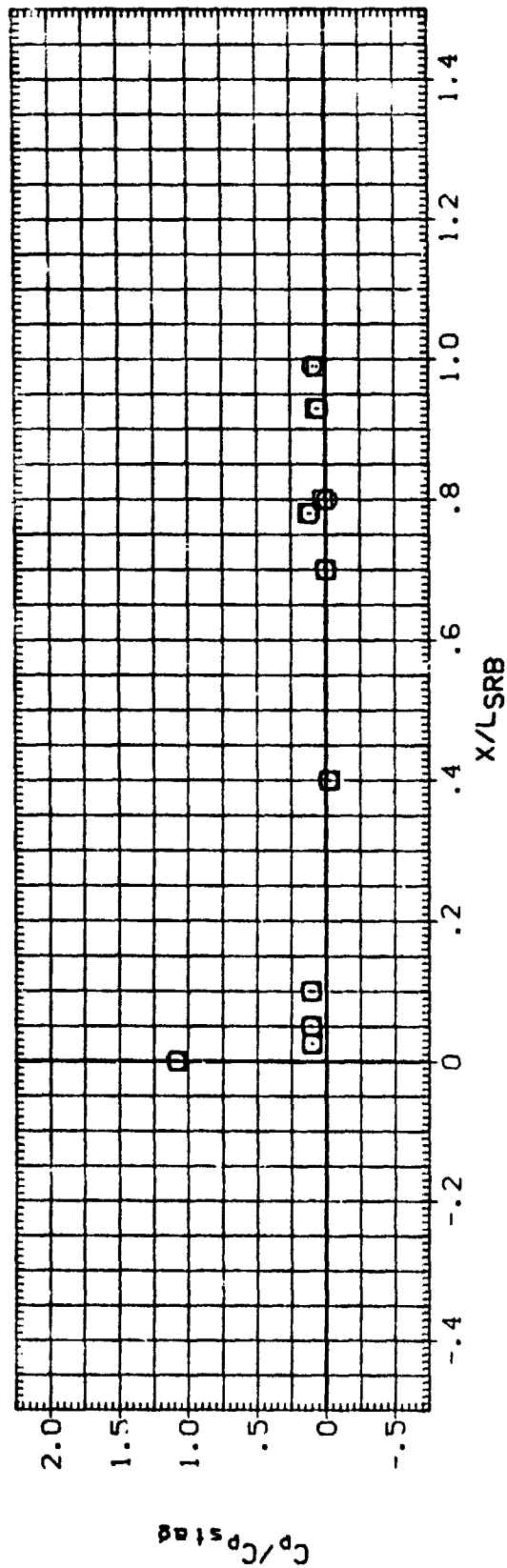


FIG. 15 VARIATION OF C_p/C_{psrb} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	PSI	MACH	RN/L	PARAMETRIC VALUES
□	.000	225.000	2.950		1.200 BETA .000
	5.000	210.000			

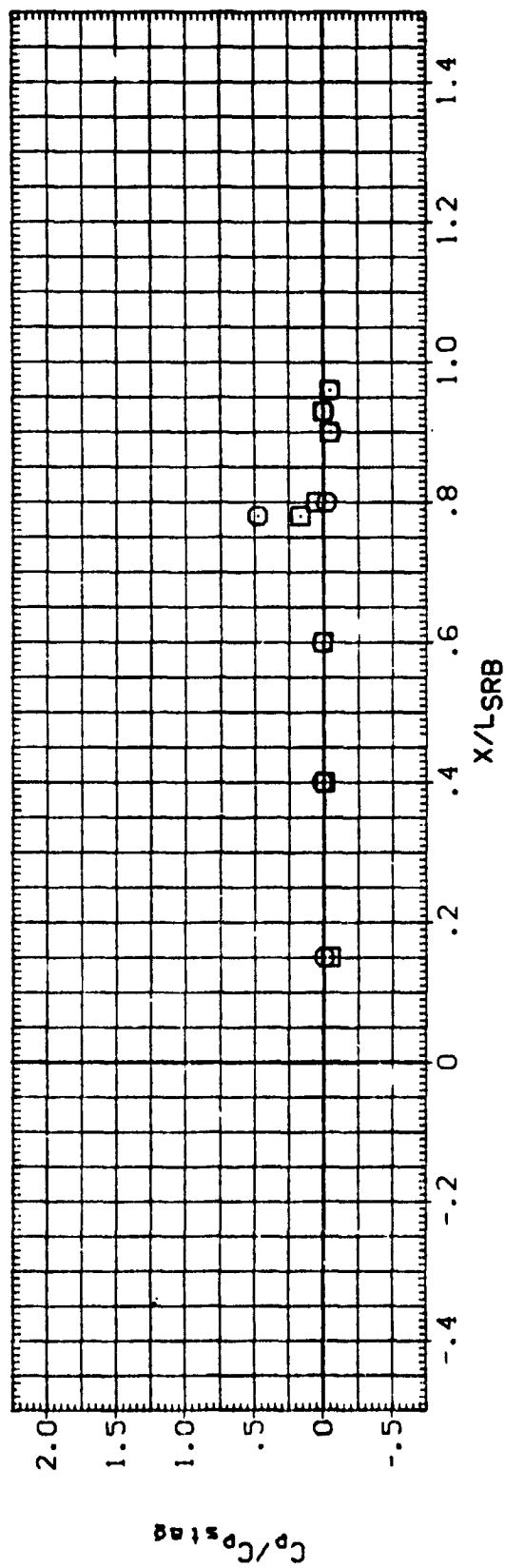
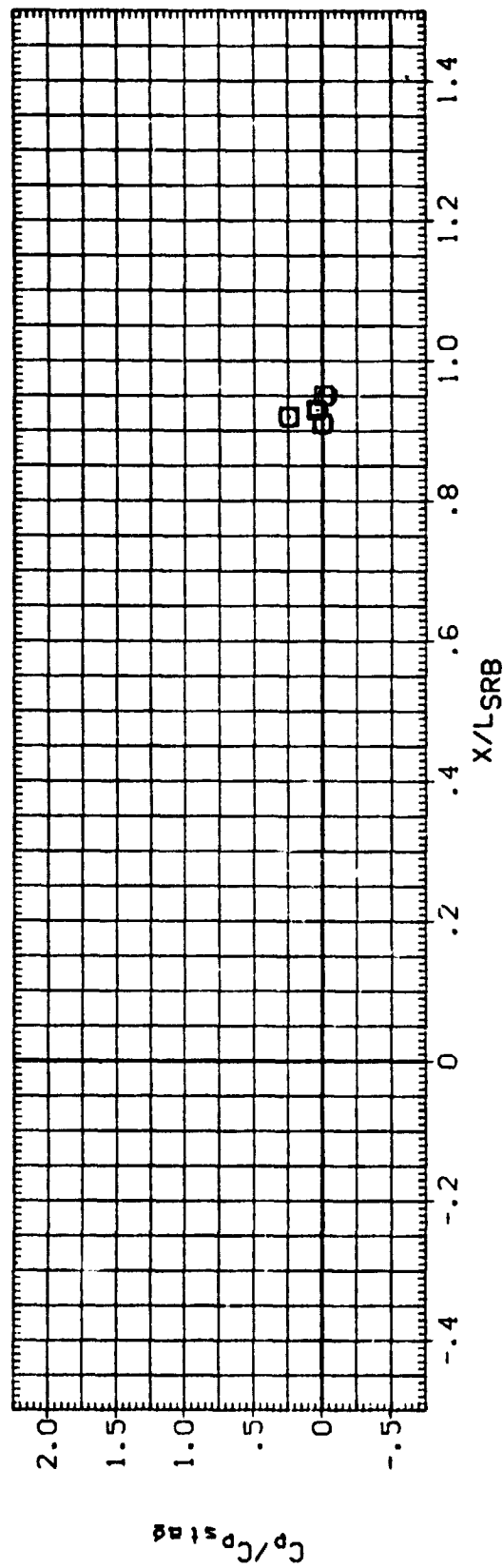


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, BETA= 0, RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSIR.

SYMBOL ALPHA PSI MACH
 0 .000 270.000 2.950
 1 5.000 247.500

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

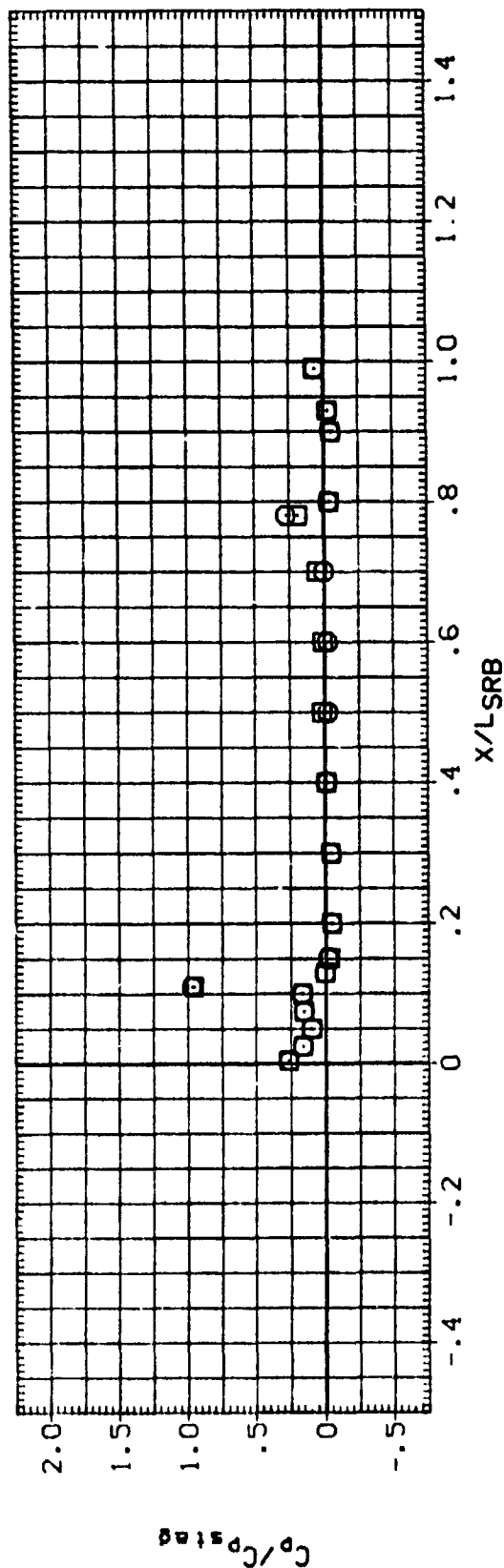
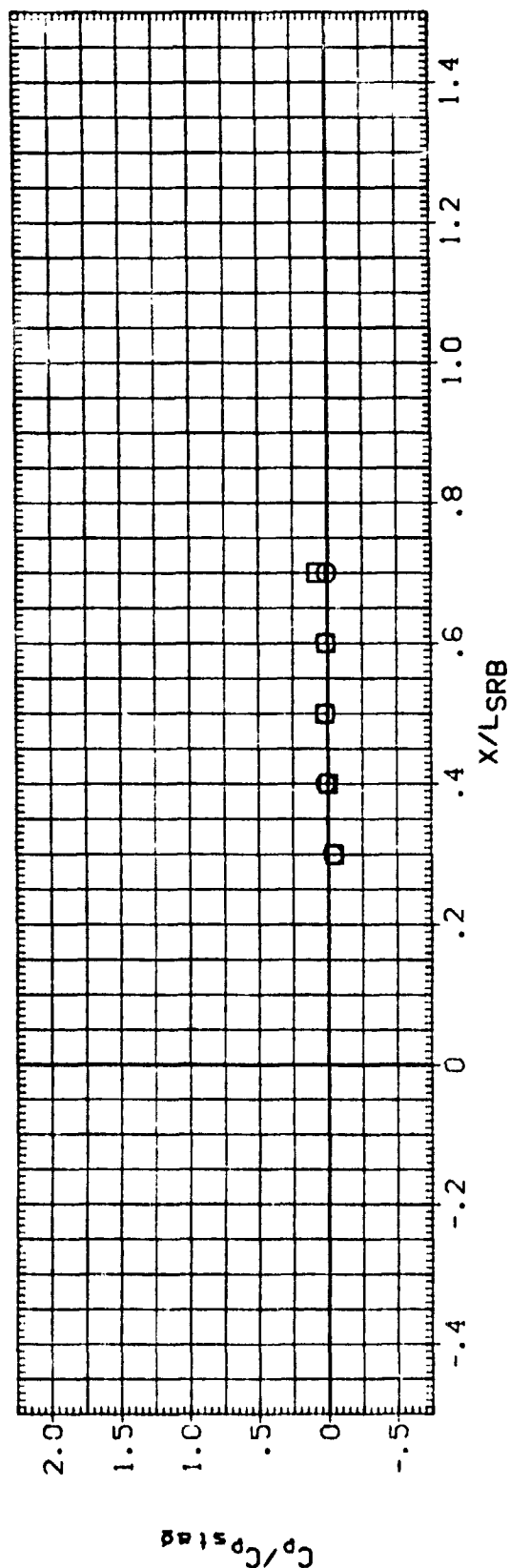


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER, BETA= 0. RN/L= 1.2

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(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 8 -5.000 270.000 3.700
 .000 247.500

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

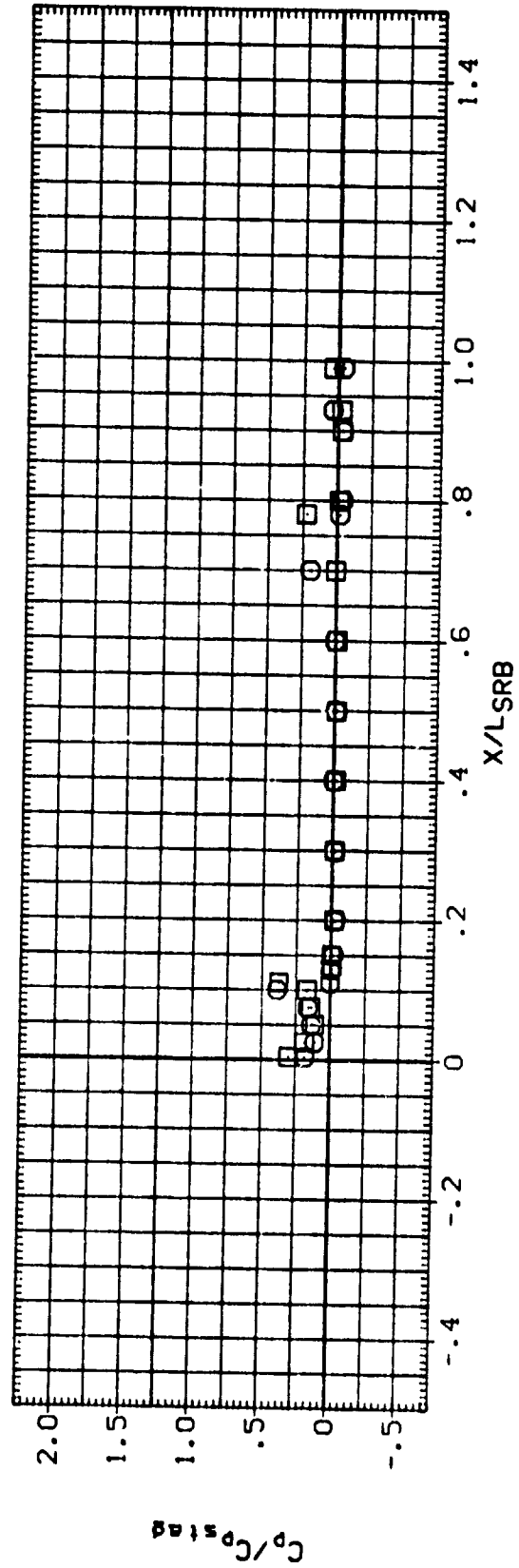
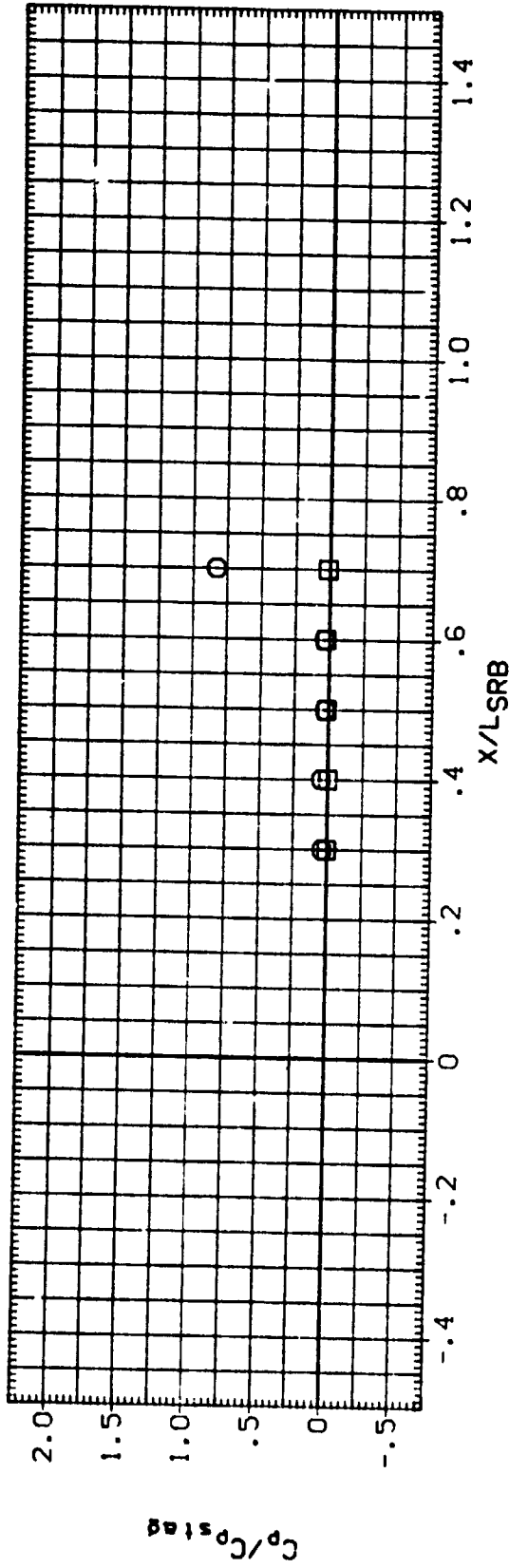


FIG. 15 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA = 0. RN/L = 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	PSI	MACH	RN/L	PARAMETRIC VALUES	BETA	.000
□	-5.000	180.000	4.600				
	.000	90.000					

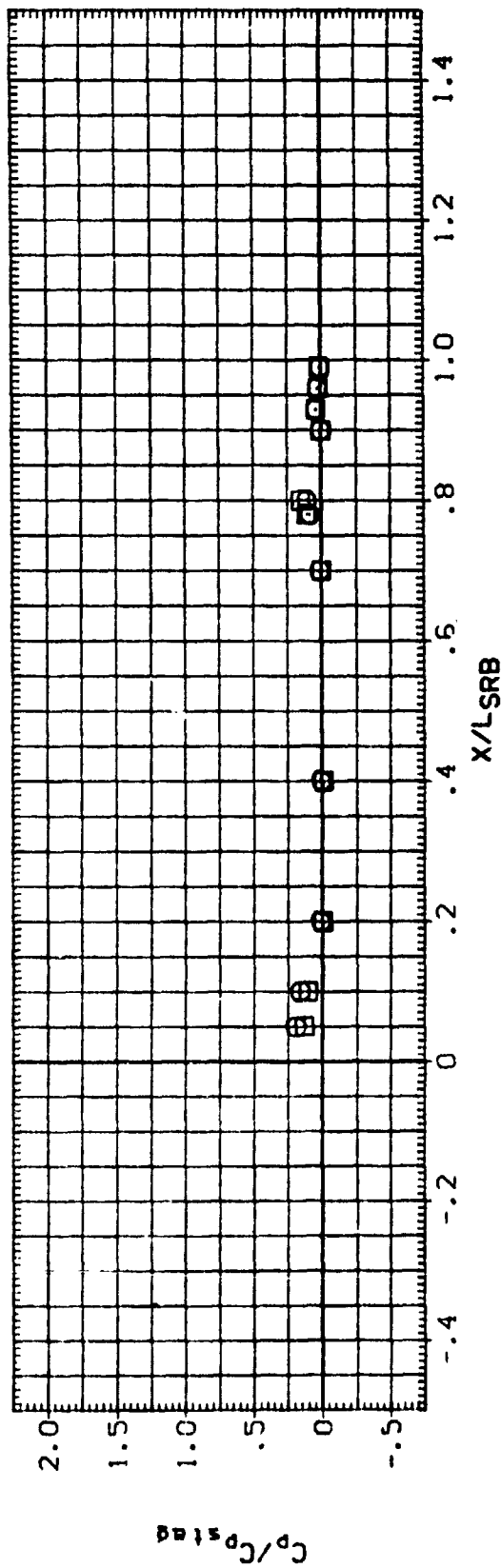
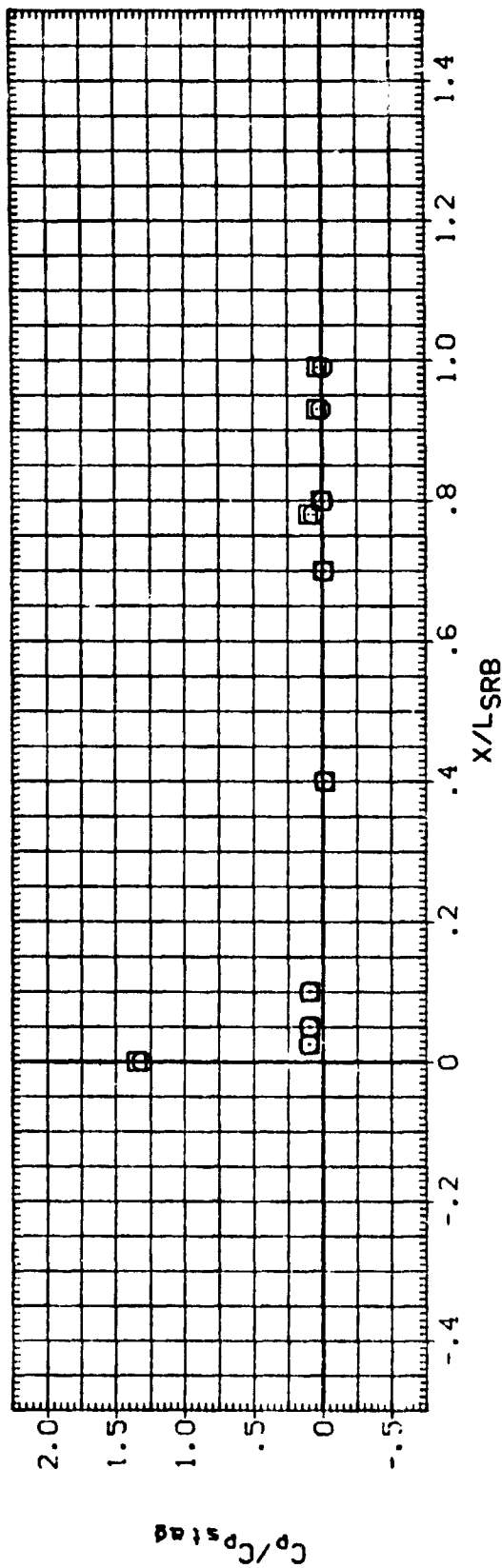


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL \square ALPHA PSI 275.000
 -5.000 210.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

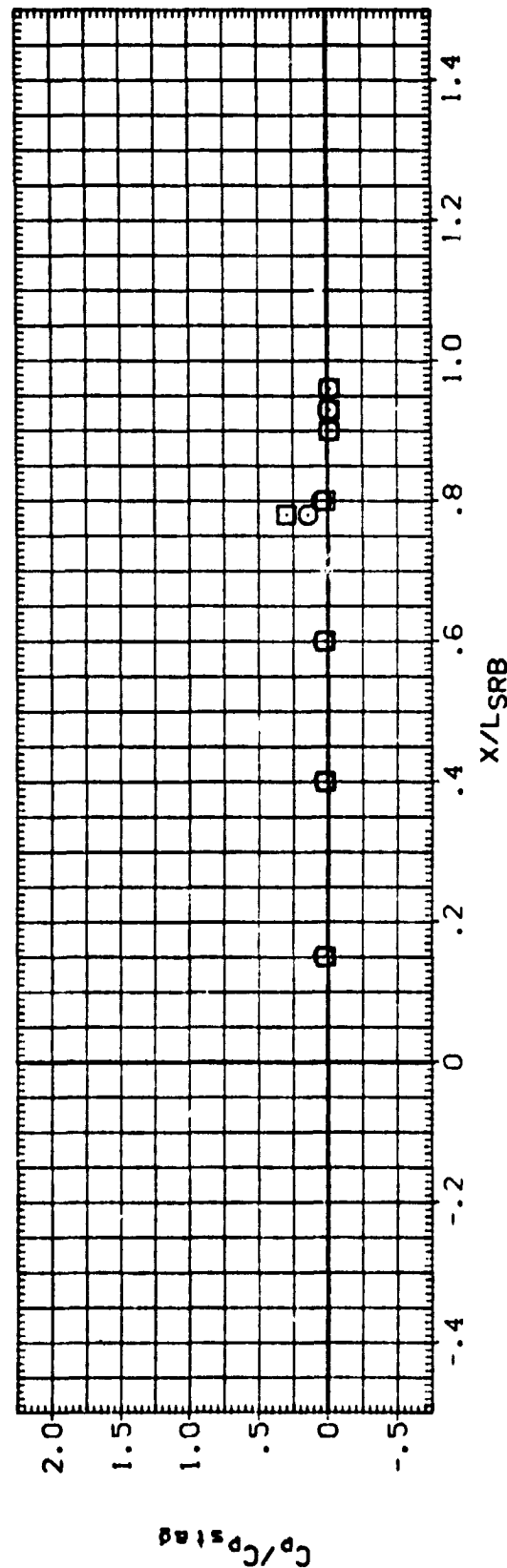
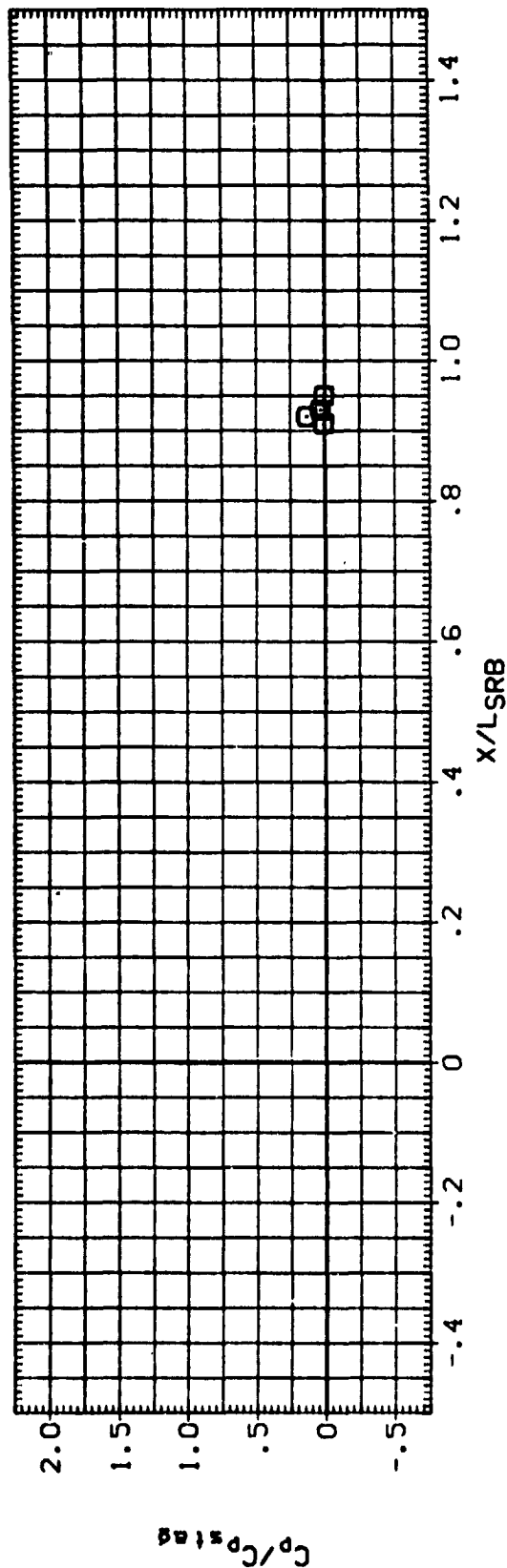


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -5.000 270.000 4.600
 .000 247.500

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

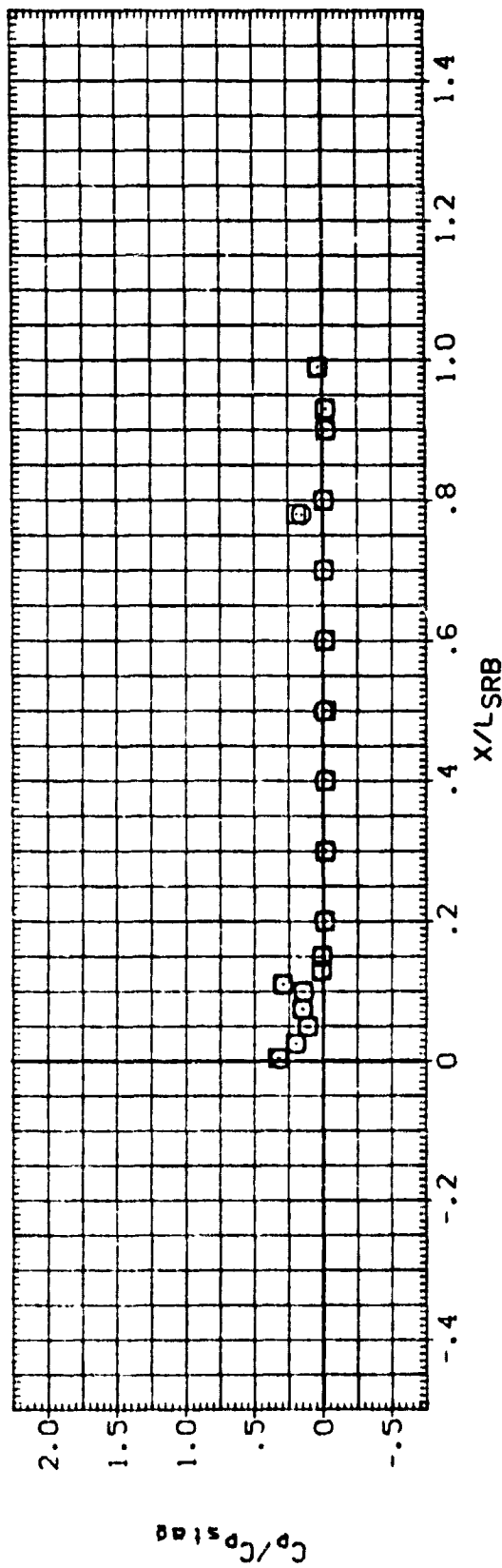
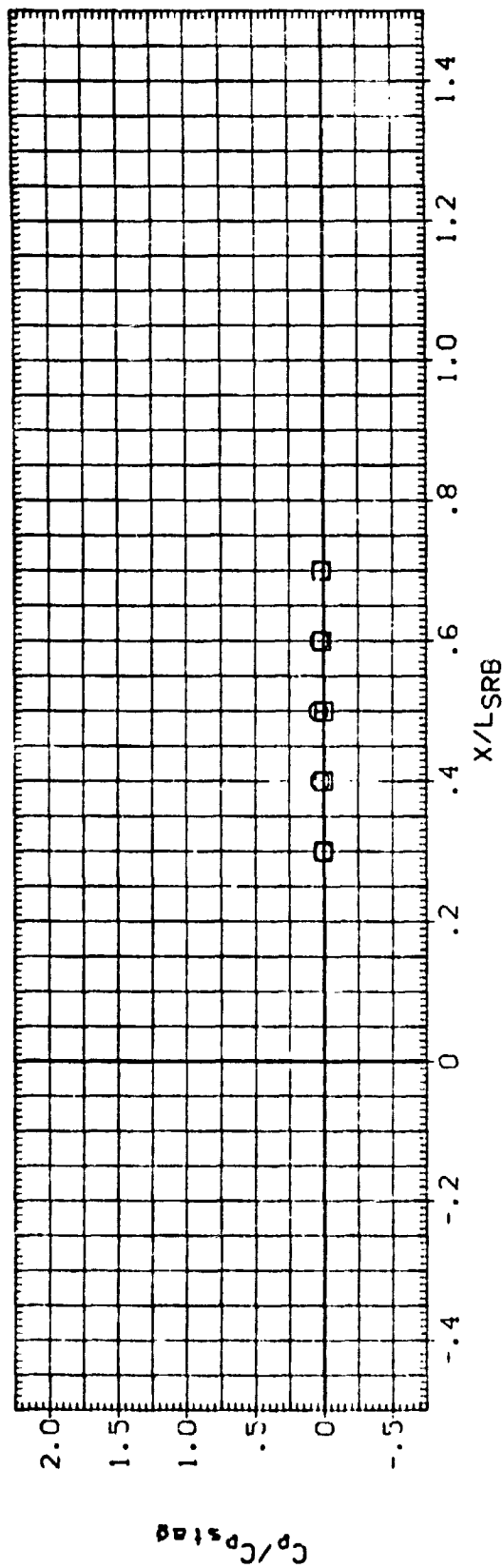


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 □ .000 .600 2.360
 □ .5000 .400

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

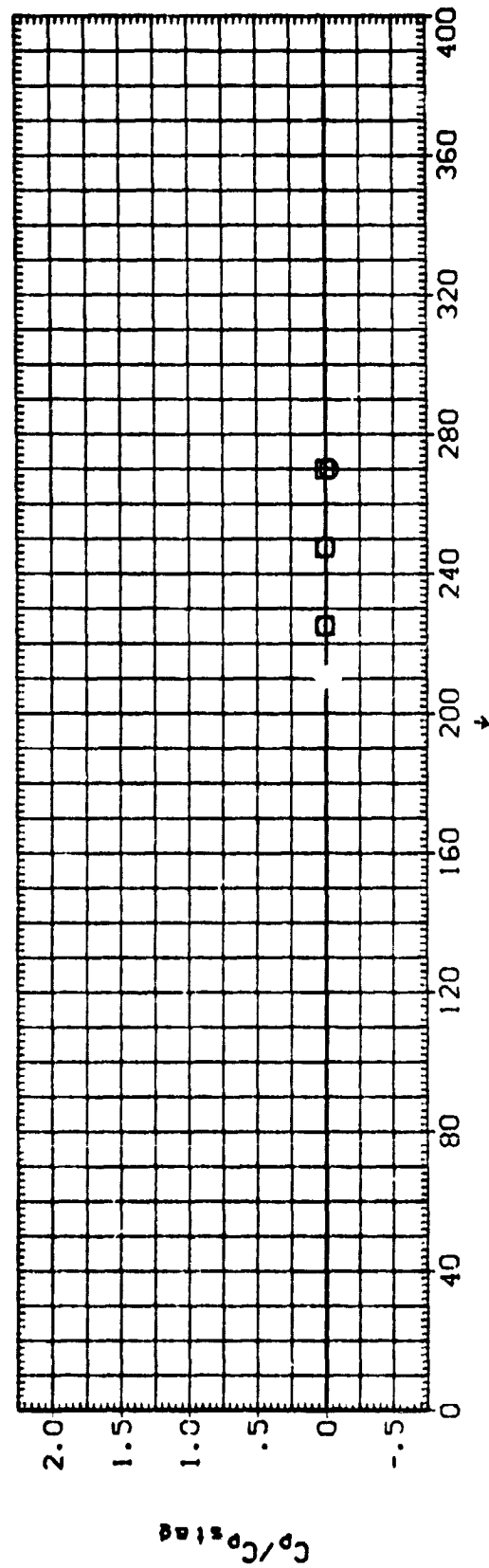
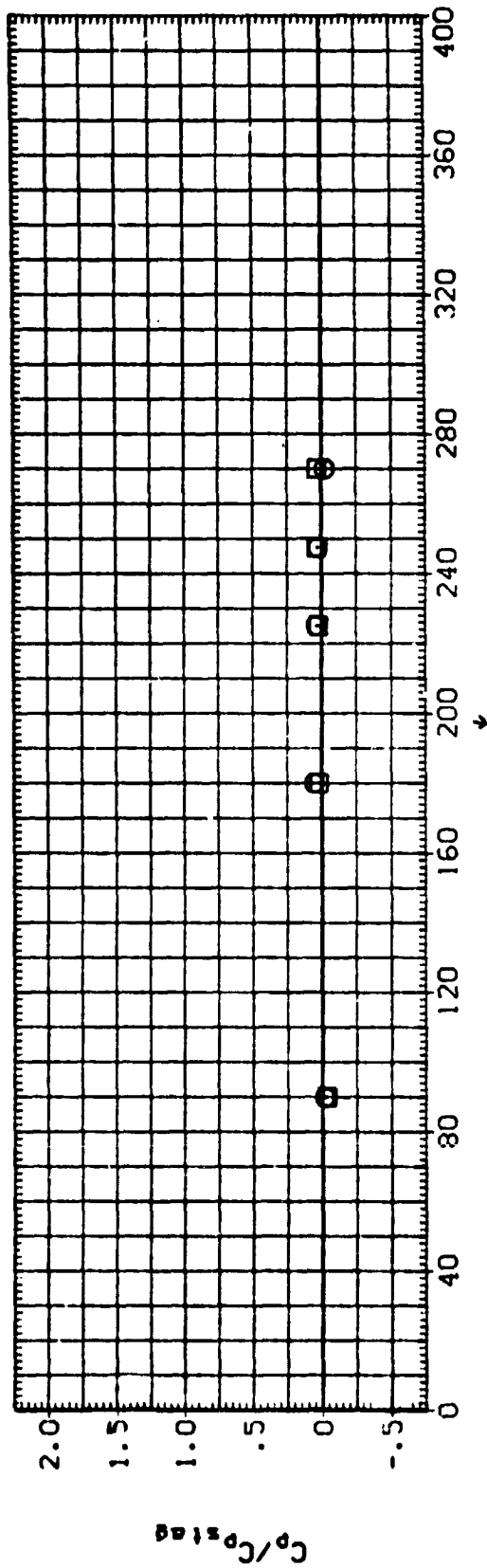


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/L SRB MACH
 □ .000 .780 2.360
 □ .000 .700

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

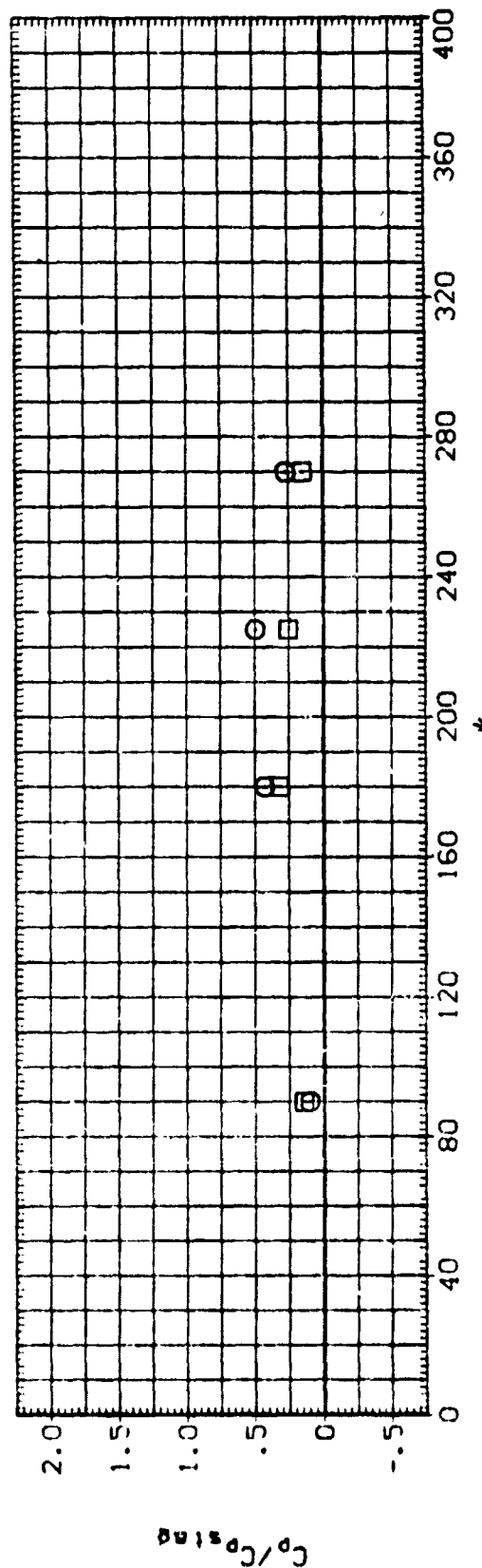
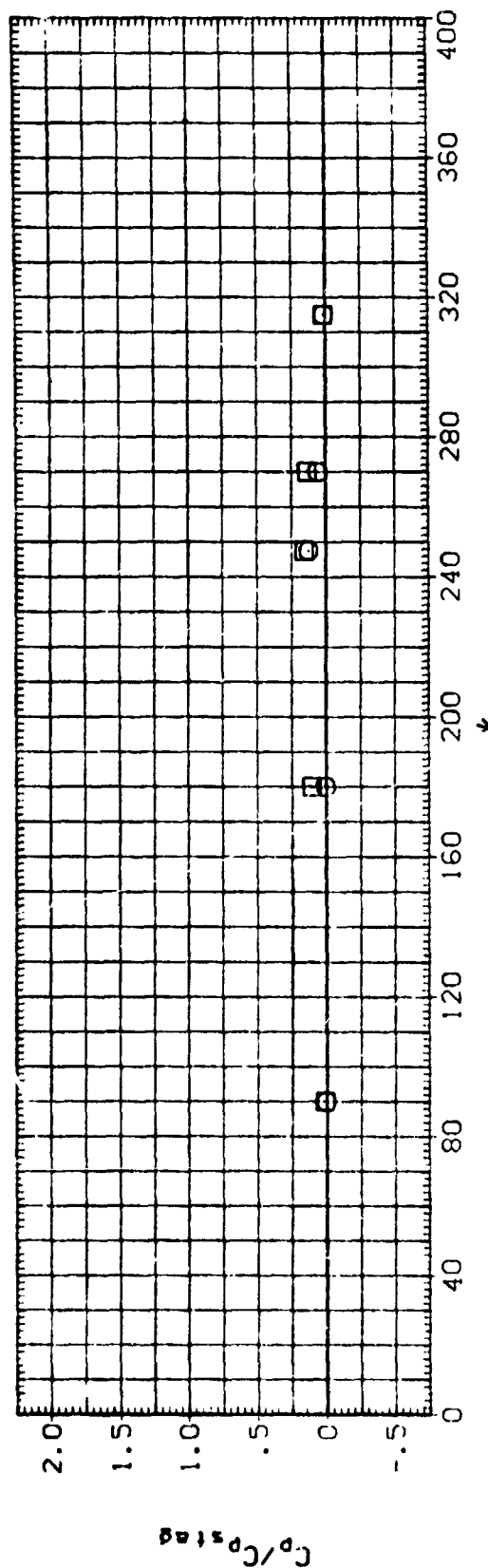


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA

□ .000

5.000

X/LSRB

.930

.800

MACH

2.360

PARAMETRIC VALUES

1.200

BETA

.000

RN/L

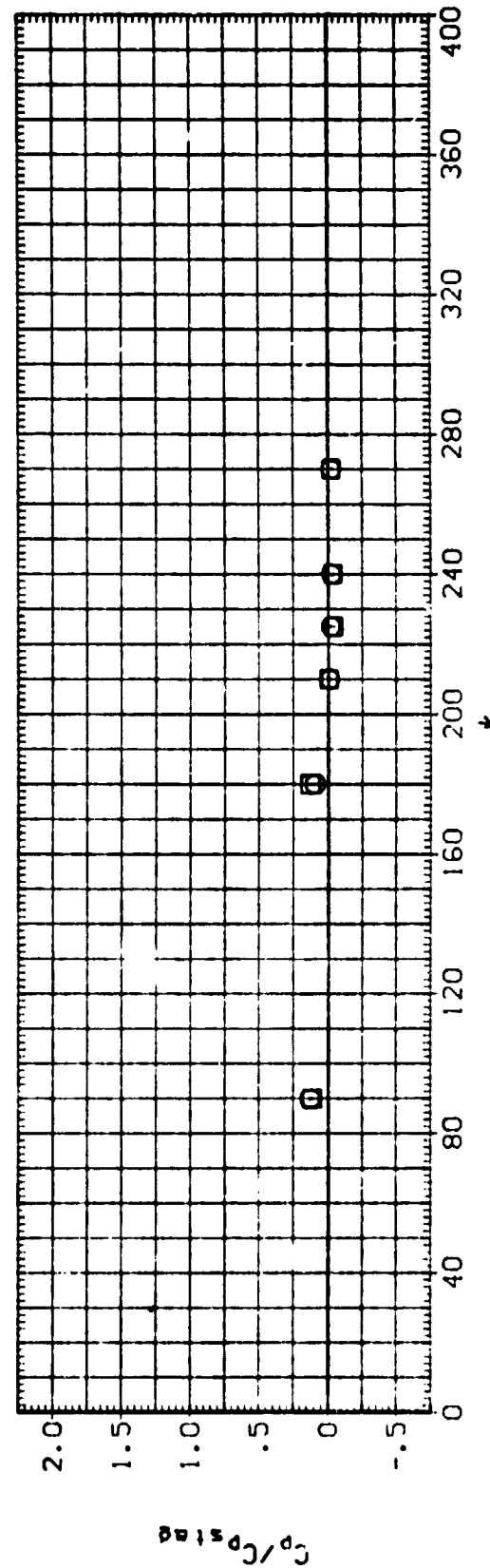
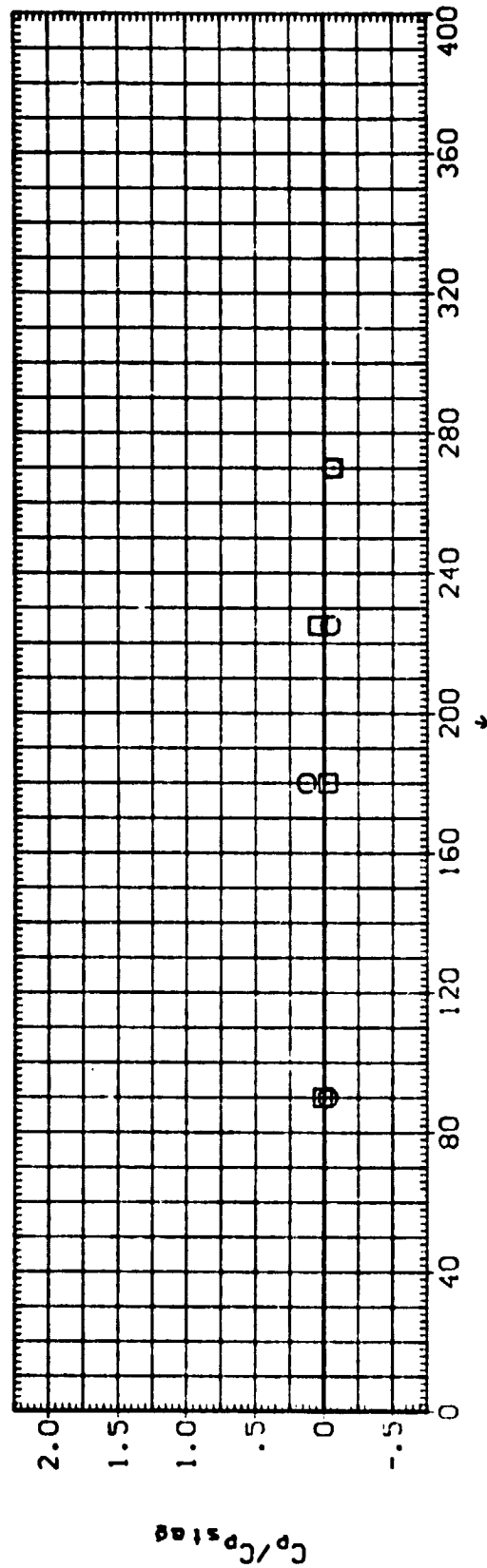


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL 

ALPHA
.000
5.000

X/LSRB
.980
.960

MACH
2.360

RN/L

PARAMETRIC VALUES
1.200 BETA

.000

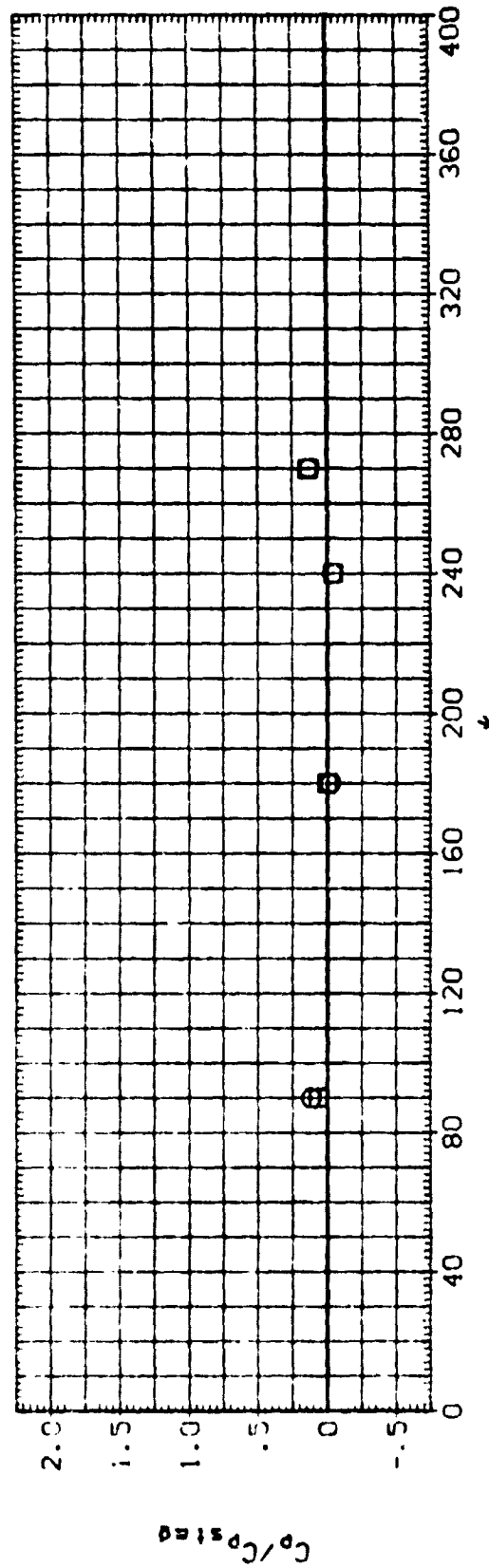
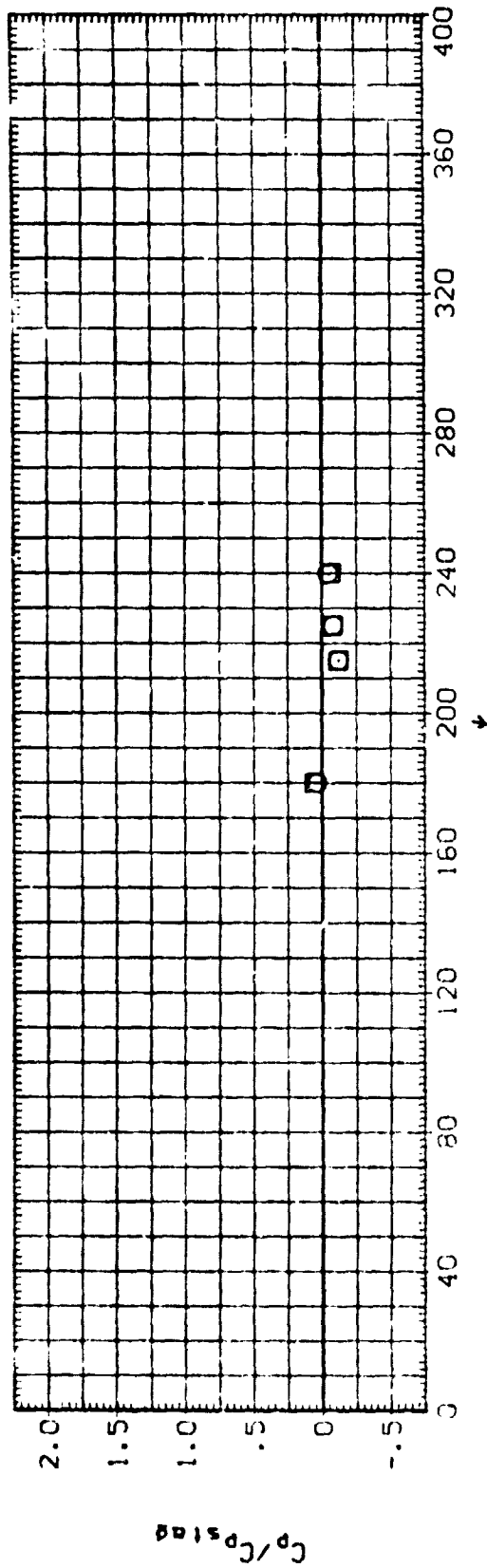


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA = 0. RN/L = 1.2

(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/L S98 MACH 2.950
 0.000 .600
 5.000 .400

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

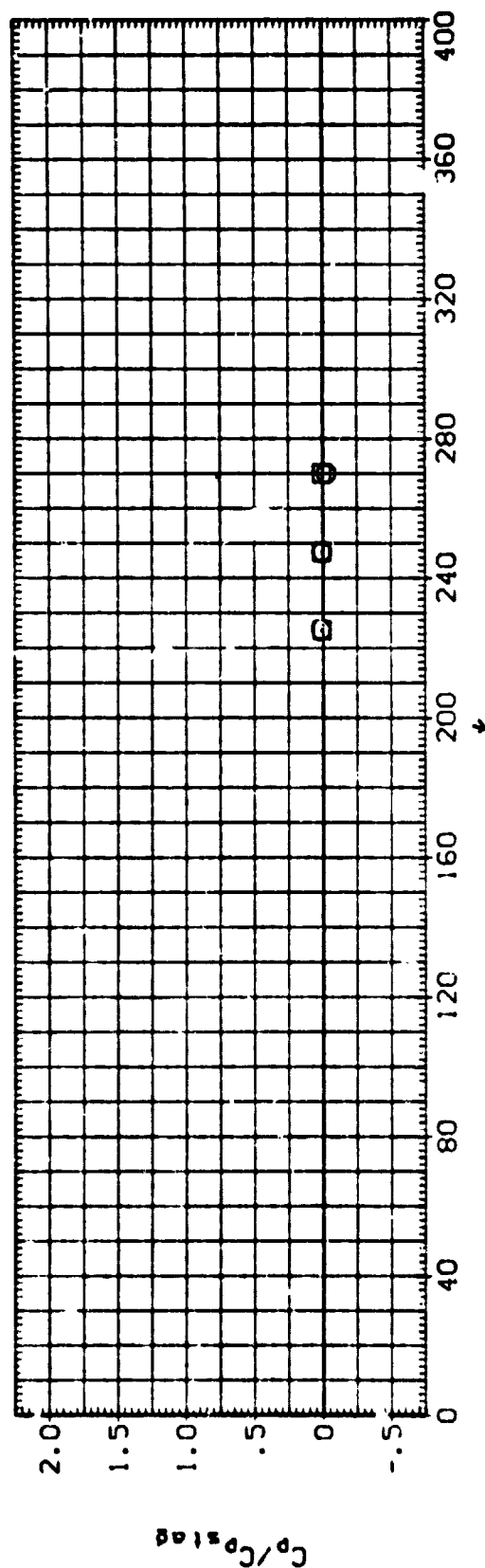
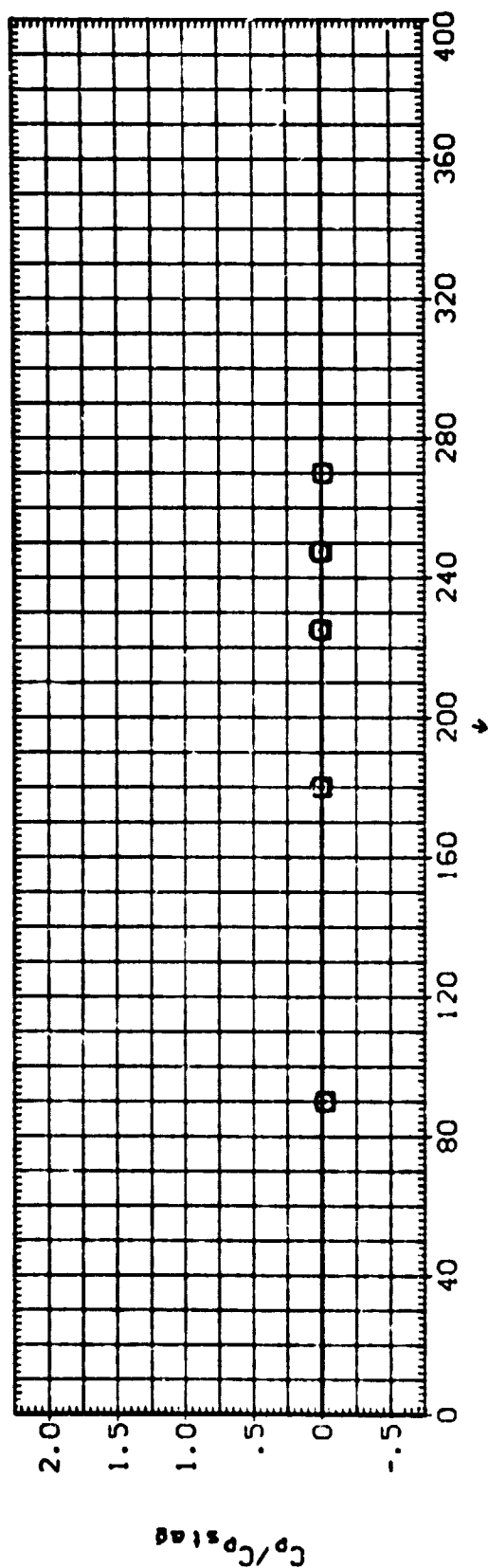


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPMA
□ .000
□ .5.000

X/LSRB MACH
□ .780 2.950
□ .700

PARAMETRIC VALUES
RN/L 1.200 BETA .000

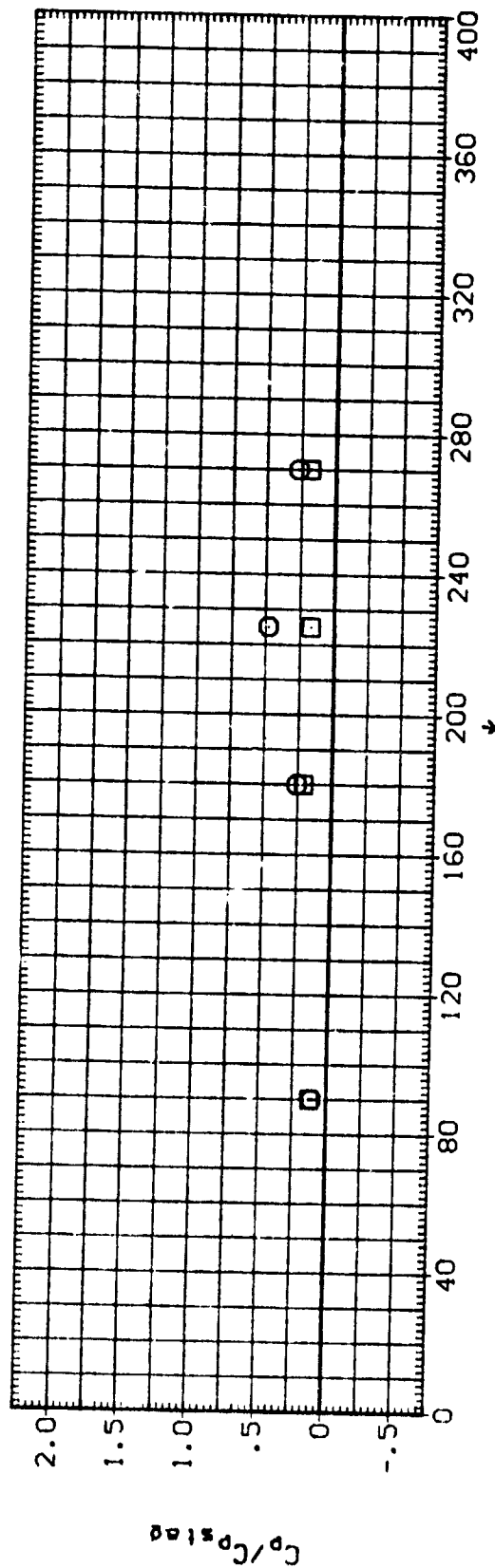
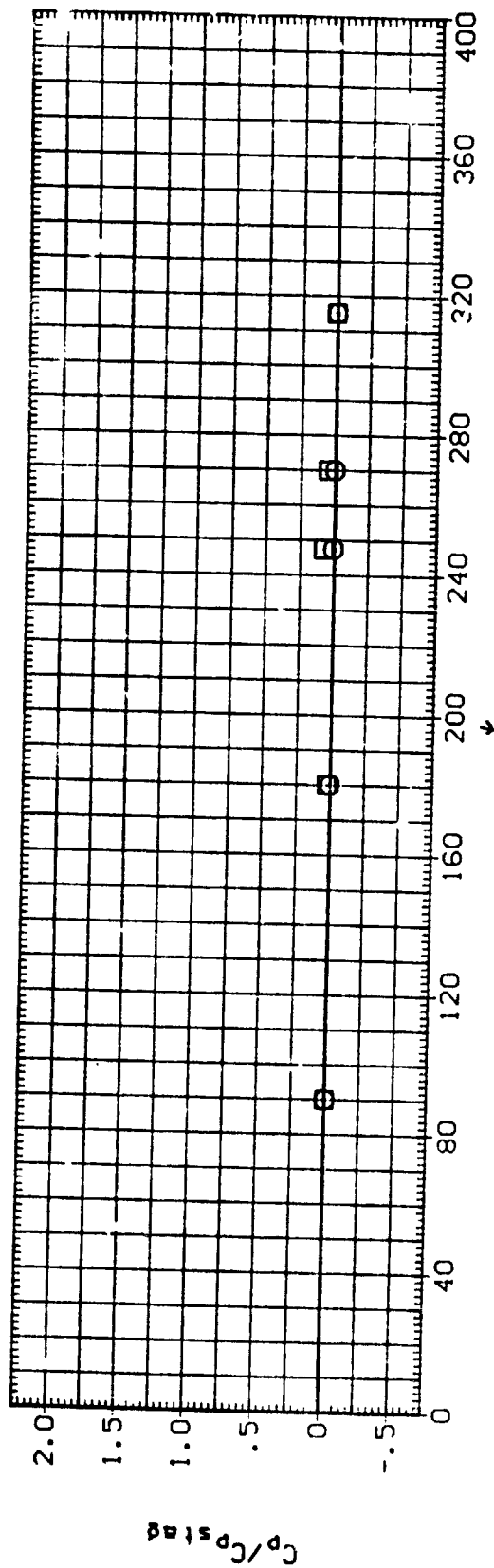


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(RG3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH .000 .930 2.950
 5.000 .800

PARAMETRIC VALUES
 1.200 BETA .000

RN/L

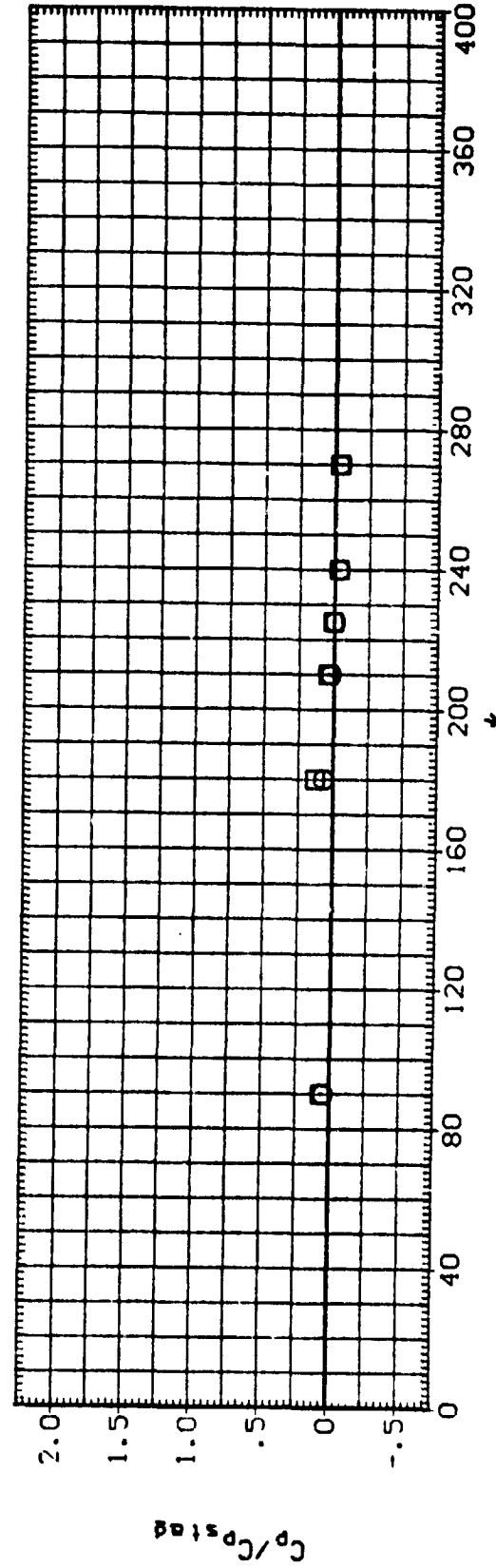
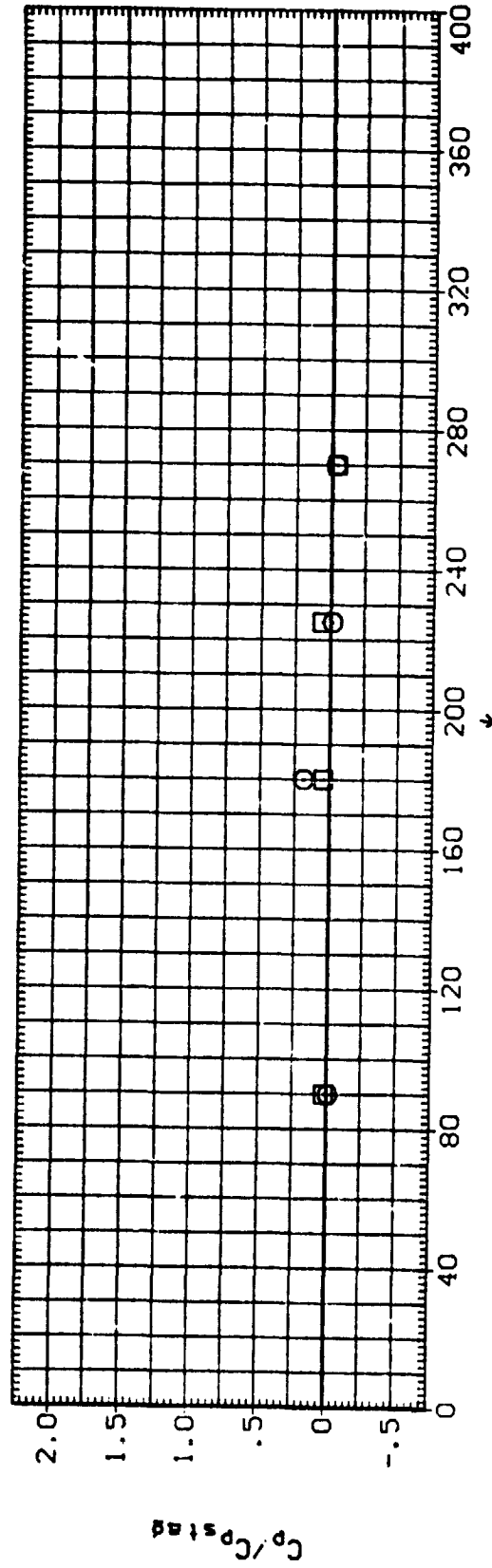


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

MACH

2.950

X/LSRB

.990

ALPHA

.000

SYMBOL

□

PARAMETRIC VALUES

1.200

BETA

.000

RN/L

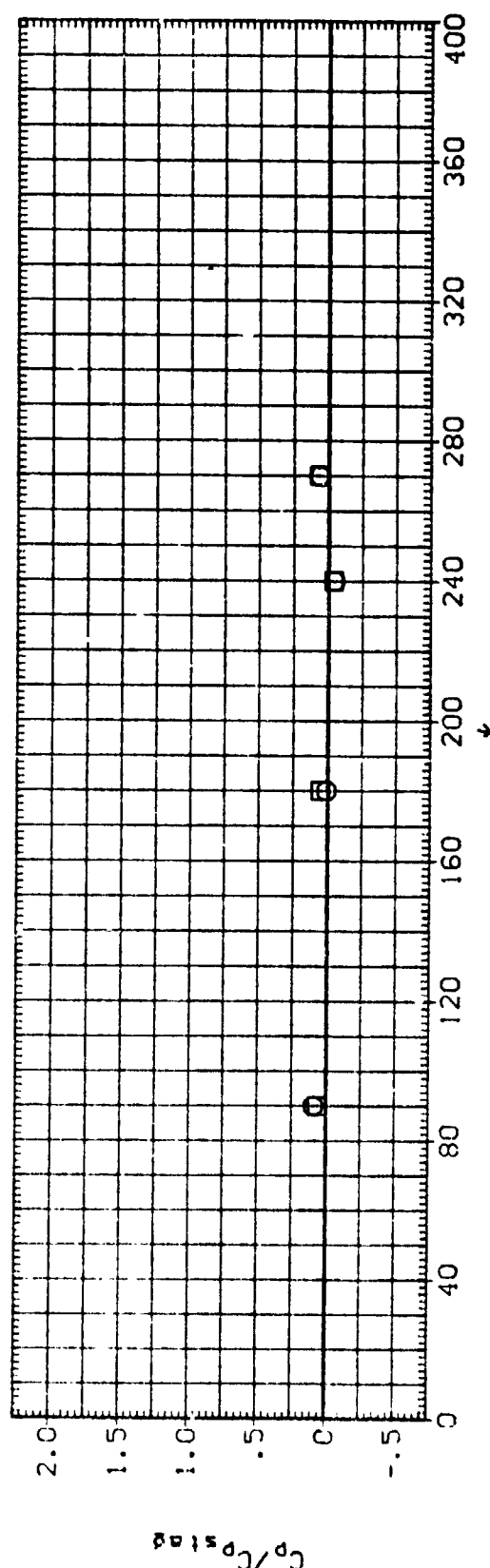
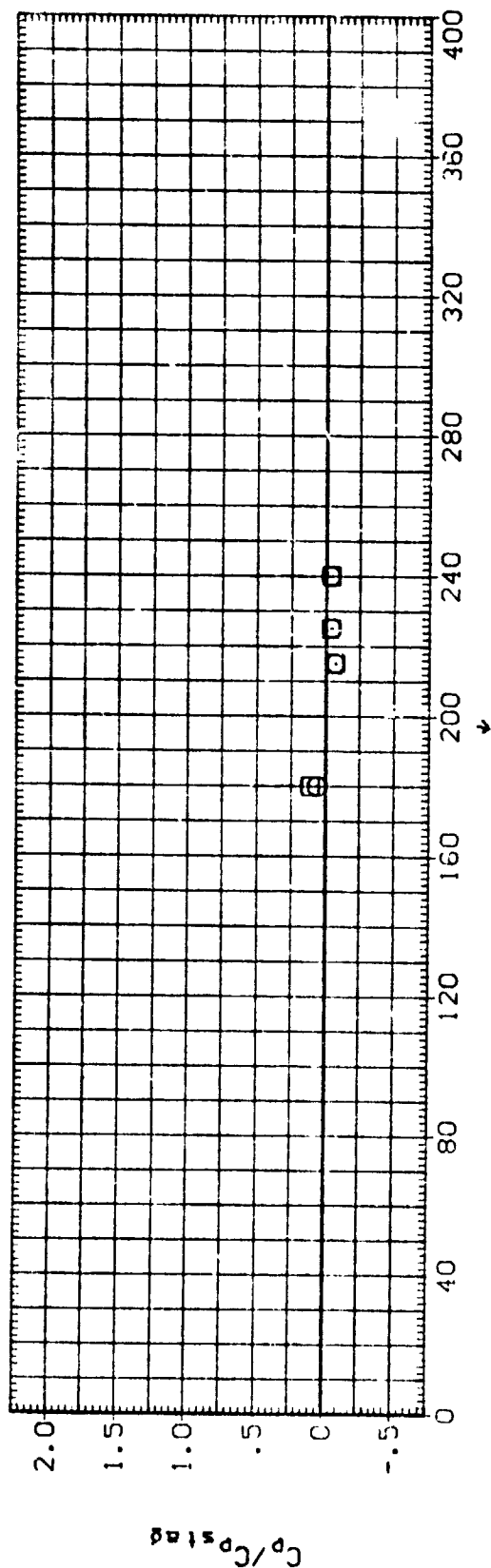


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
□ -5.000
□ .000

X/LSRB MACH
□ .600
□ 2.700

RN/L

PARAMETRIC VALUES
1.200 BETA .000

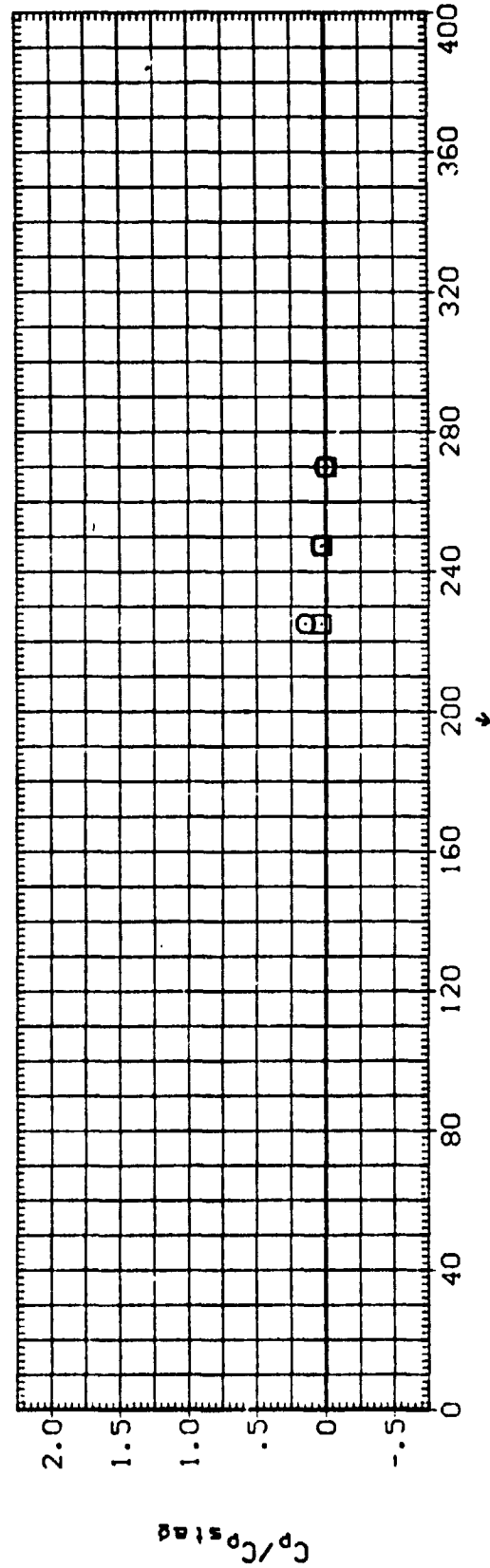
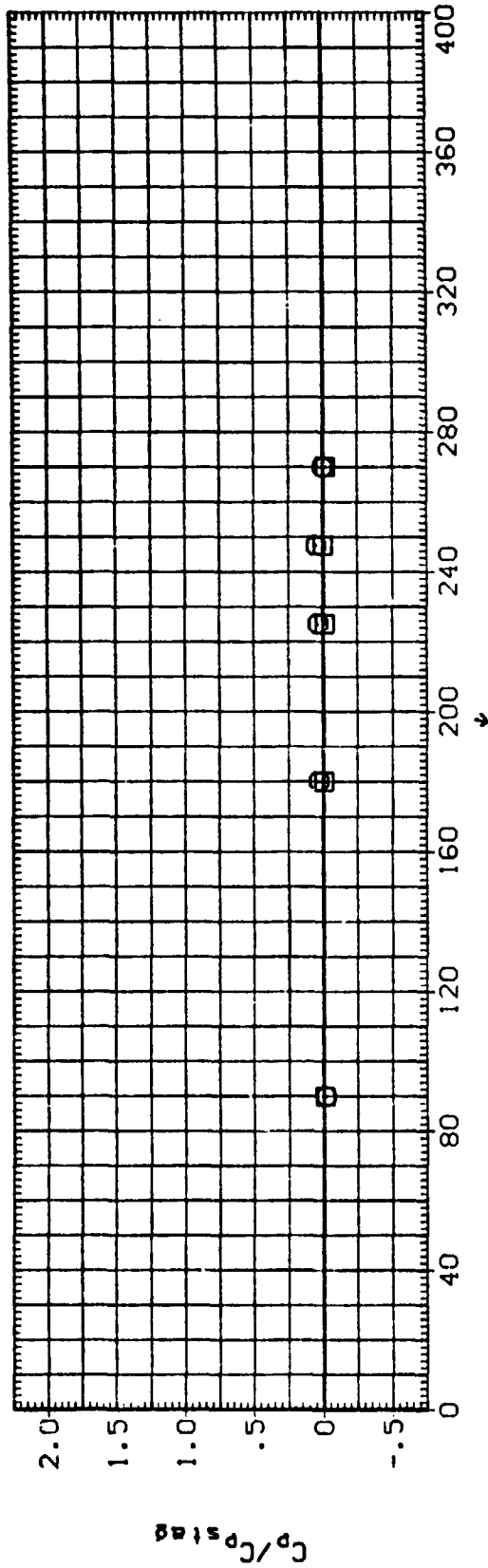


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, BETA= 0. RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSR8 MACH
 -5.000 .780 3.700
 .000 .700

PARAMETRIC VALUES
 RN/L 1.200 BETA .030

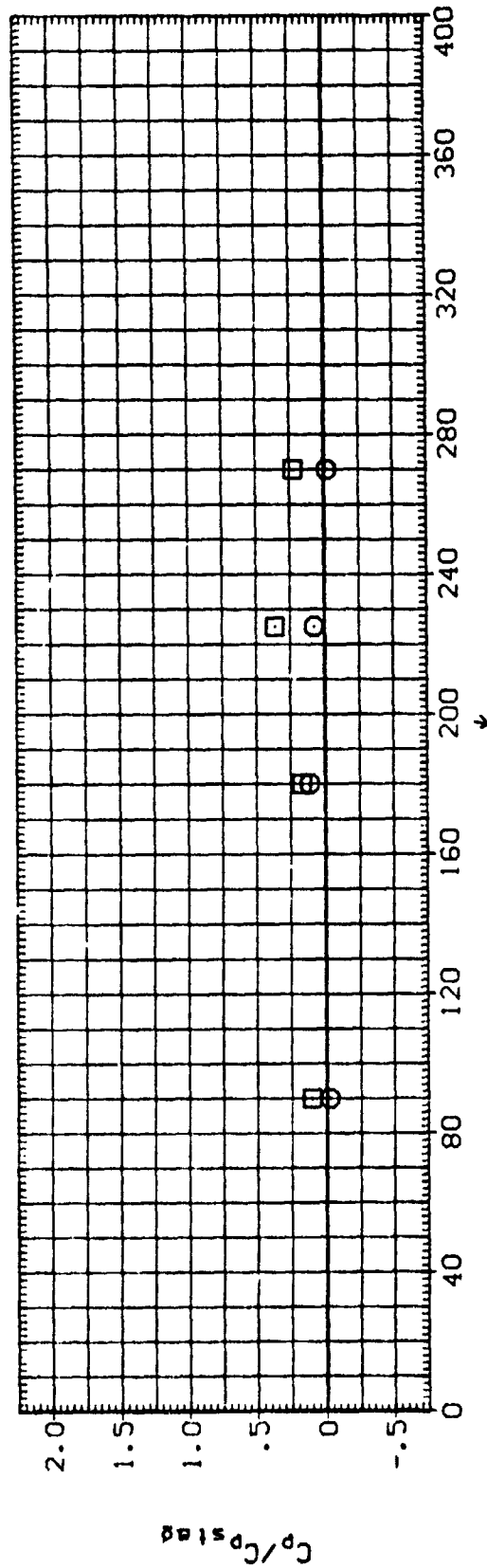
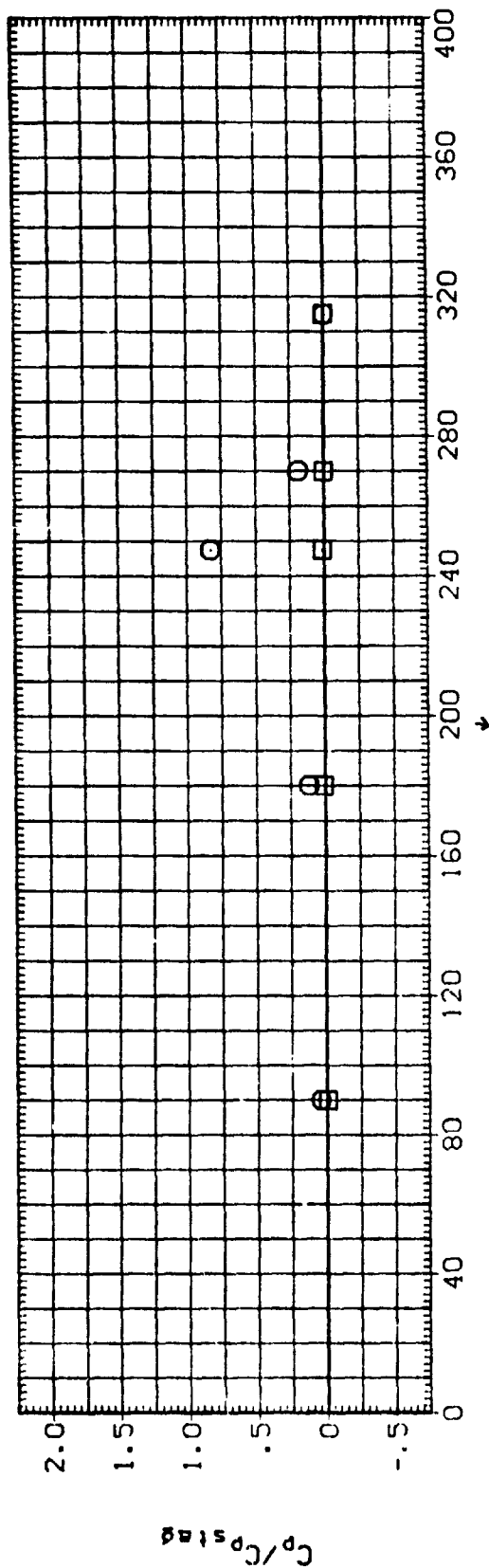


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 -5.000 .930 3.700
 .000 .800

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

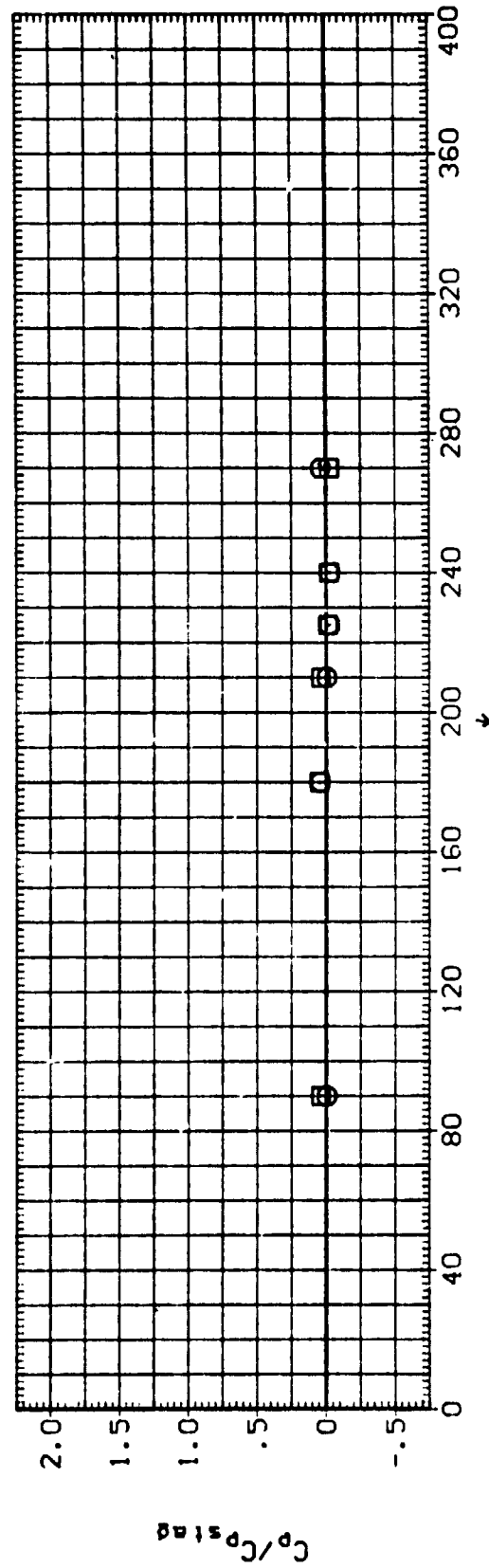
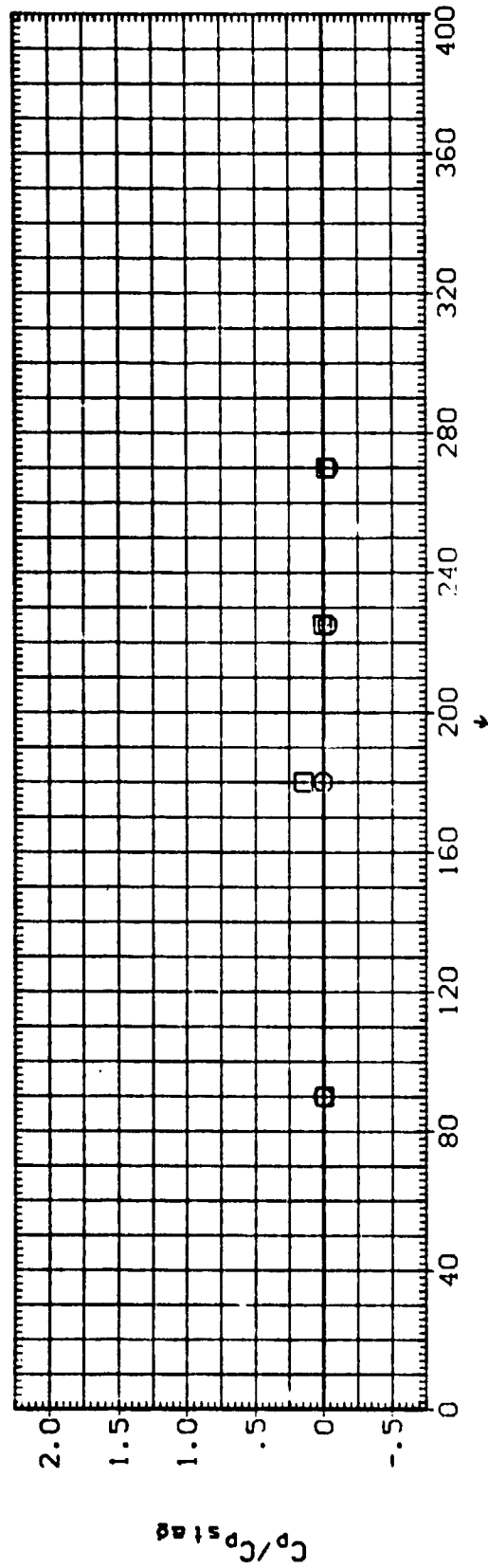


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(RQ3SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
B -5.000

X/LSR8 .990
.960

MACH 3.700

RN/L

PARAMETRIC VALUES
1.200 BETA

.000

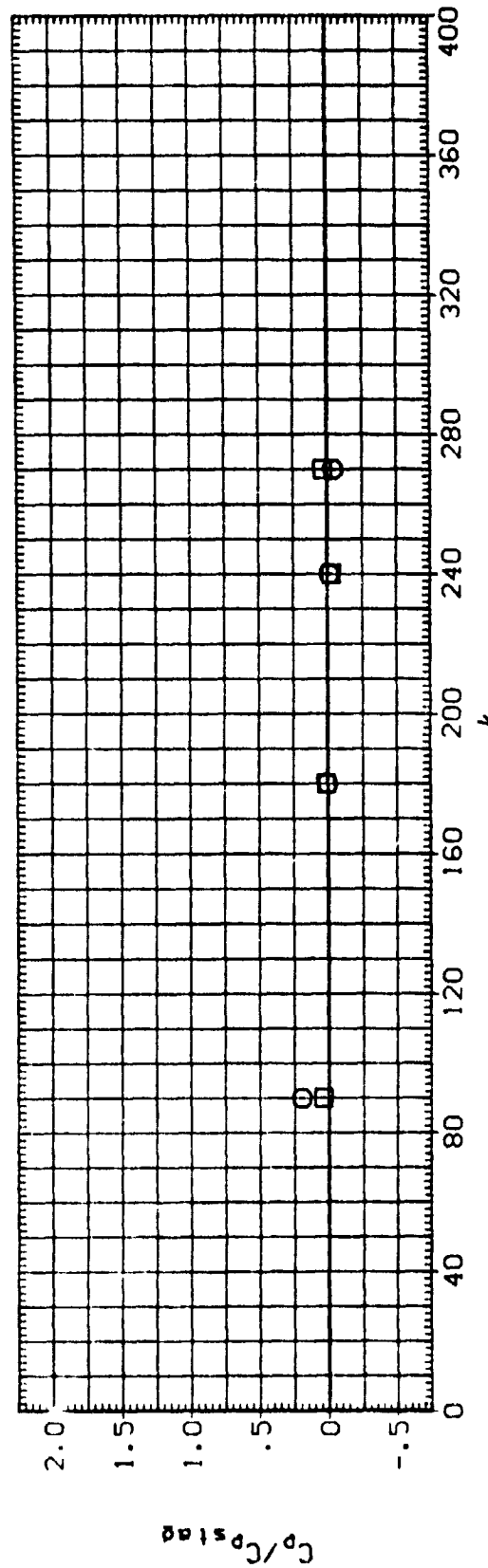
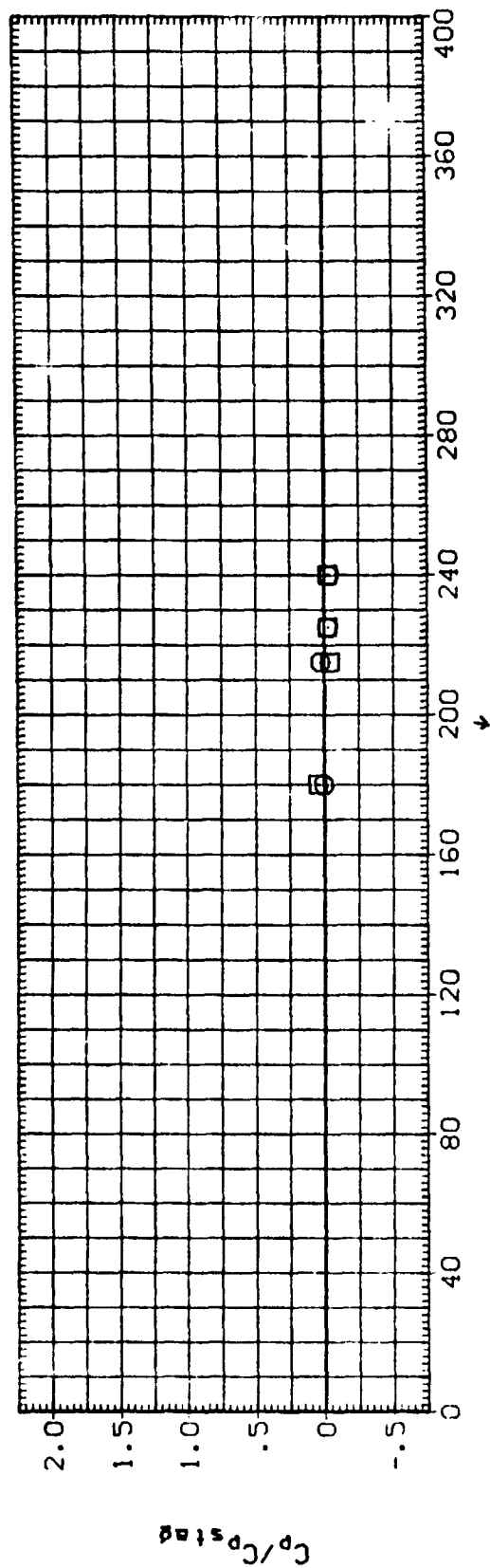
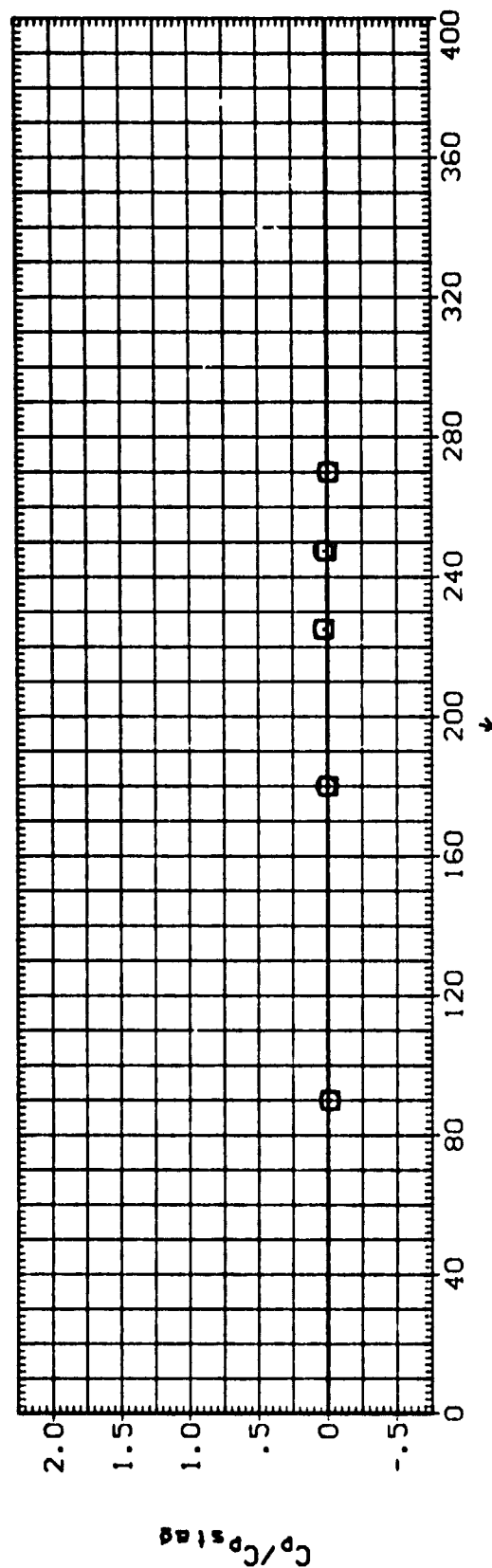


FIG. 15 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, BETA= 0, RN/L= 1.2

(RQ3SAA) UPWT 1059 (JH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	X/LSRB	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.600	4.600		1.200
	.000	.400			BETA
					.000



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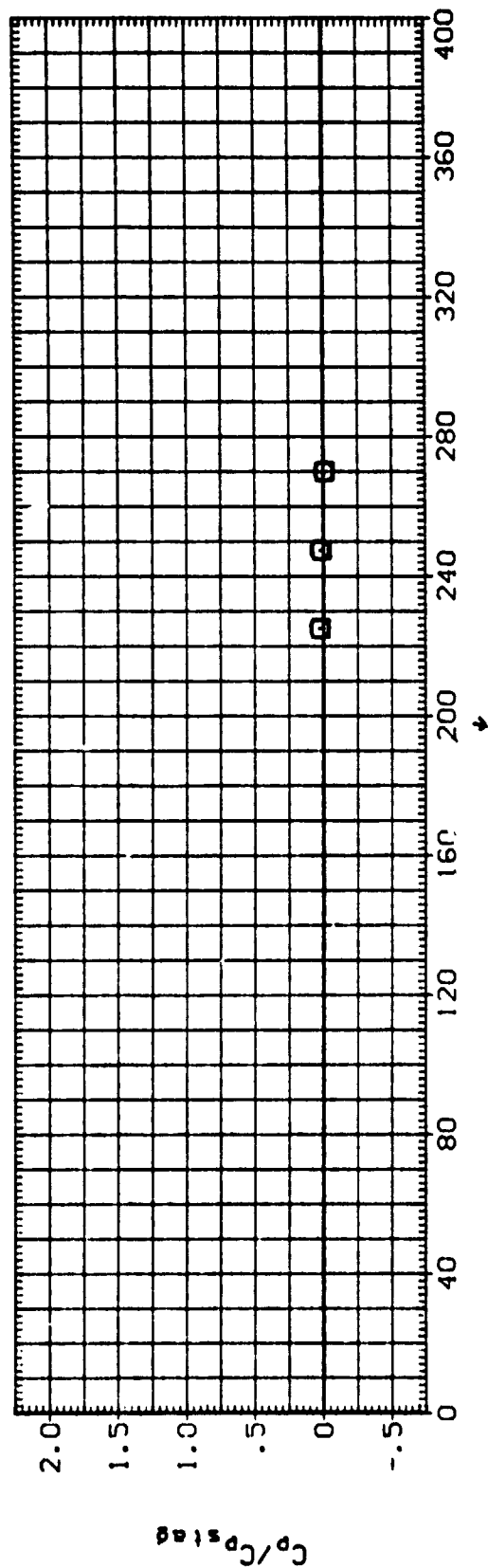


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA K/LSRB MACH
 □ -5.000 .780 4.600

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

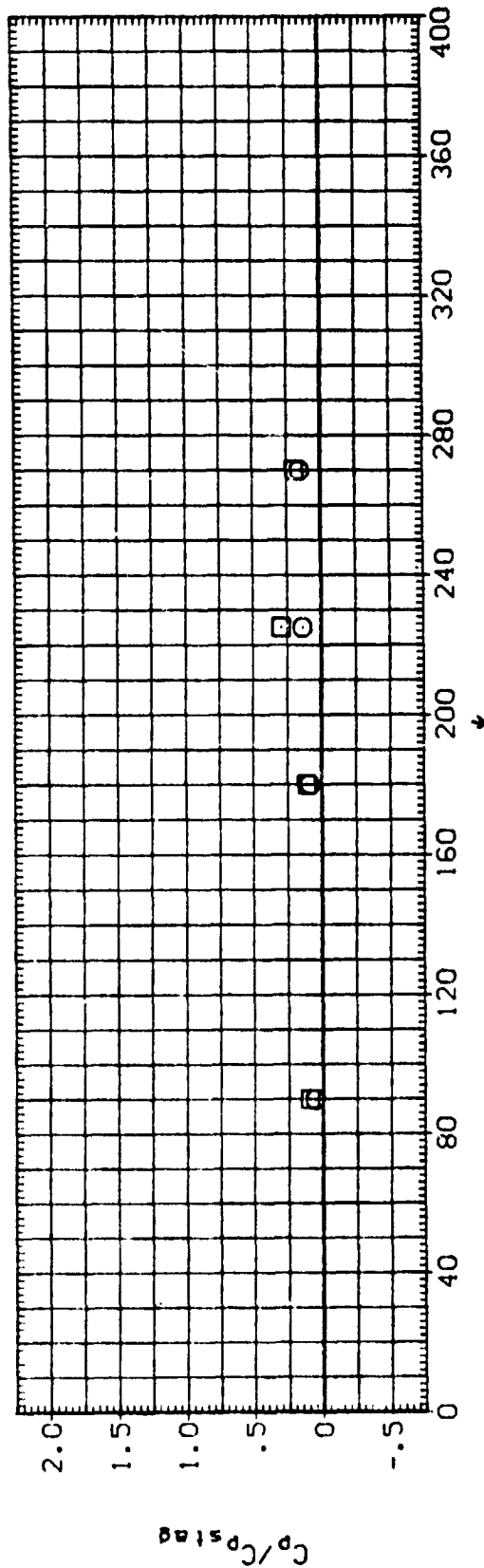
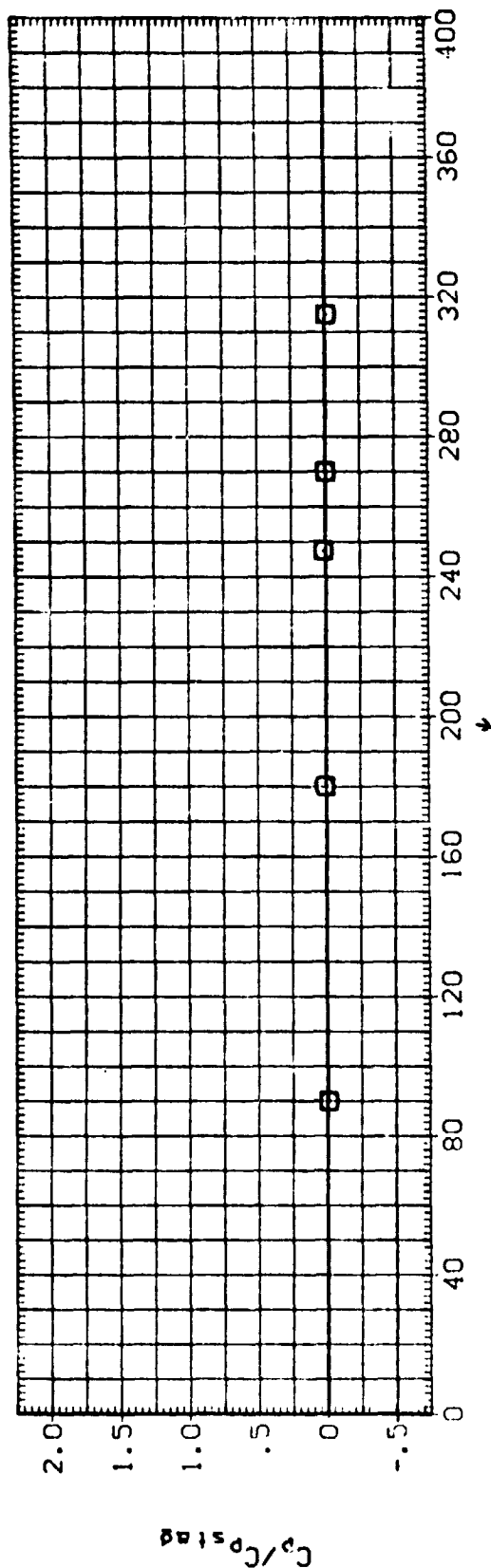


FIG. 15 VARIATION OF C_p/C_{pstag} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R03SAA) UPWT 1059 (1H4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 -5.000 .930 4.600
 .000 .800

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

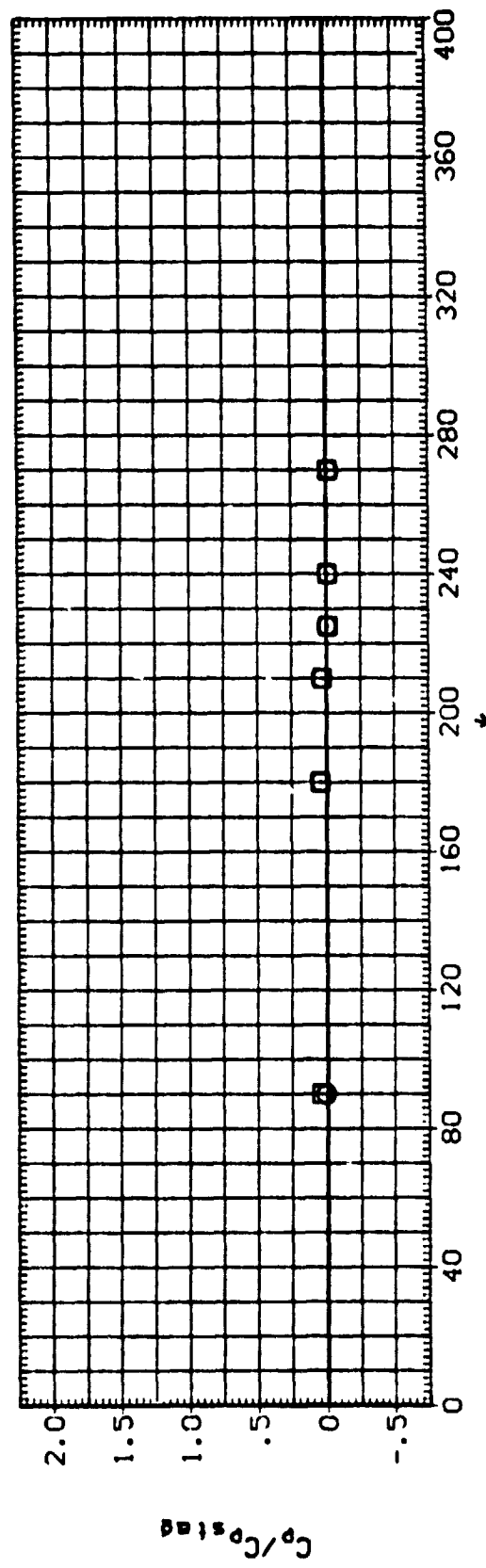
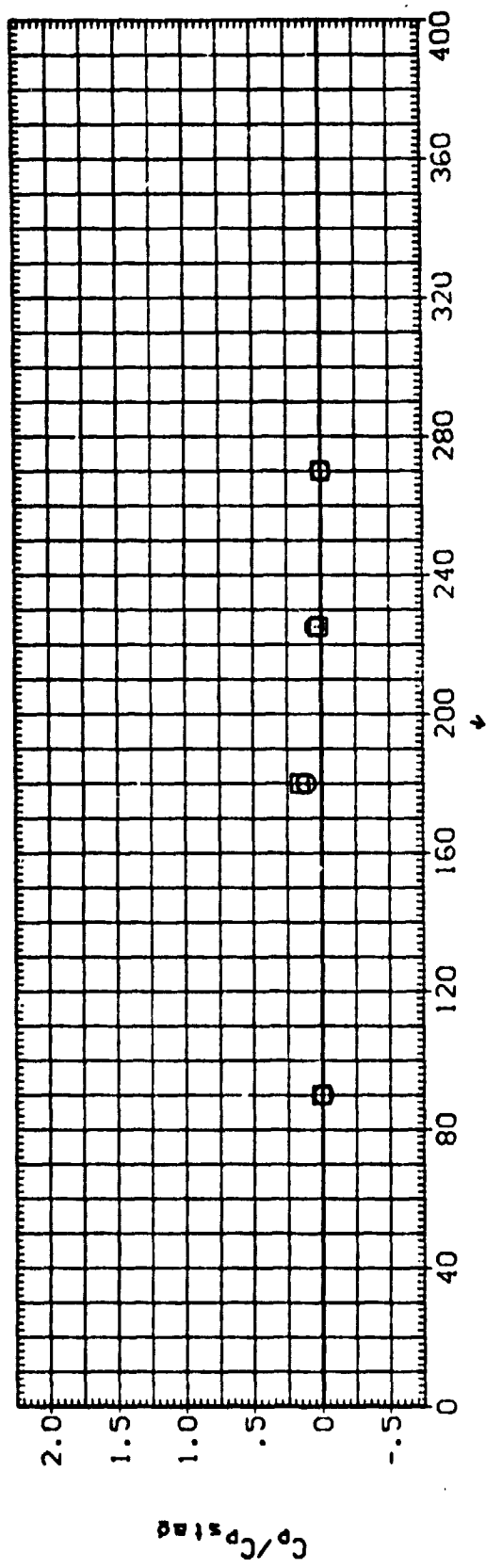
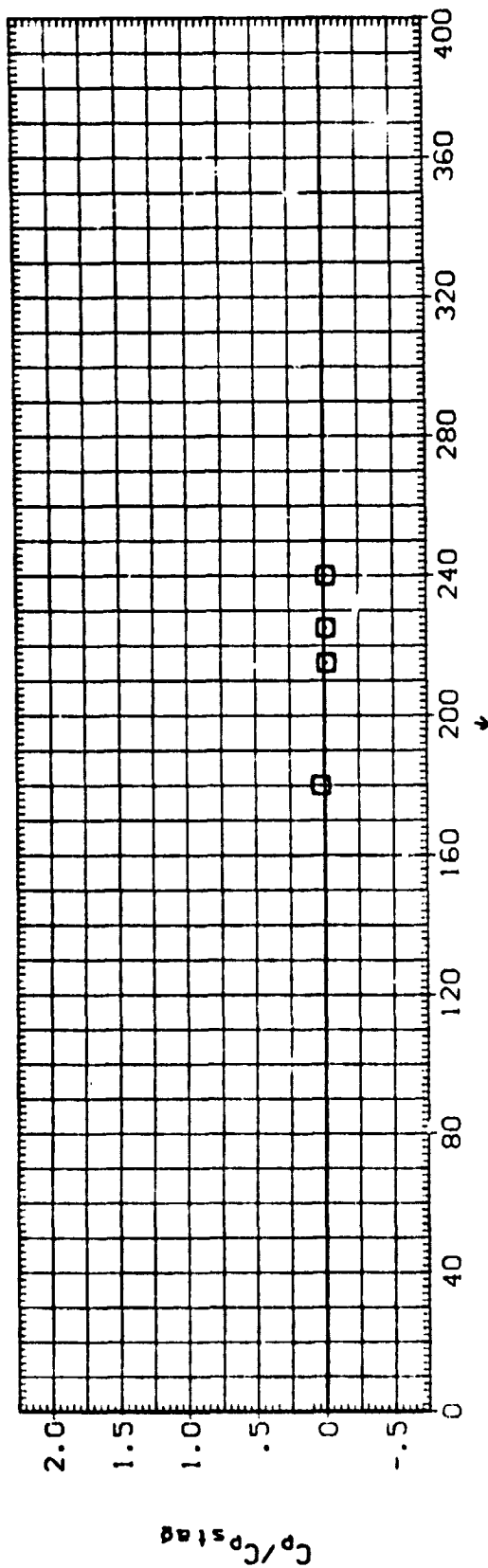


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R03SAA) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 □ -5.000 .990 4.600

PARAMETRIC VALUES
 RN/L 1.200 BETA .000



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 ORIGINAL PAGE IS POOR

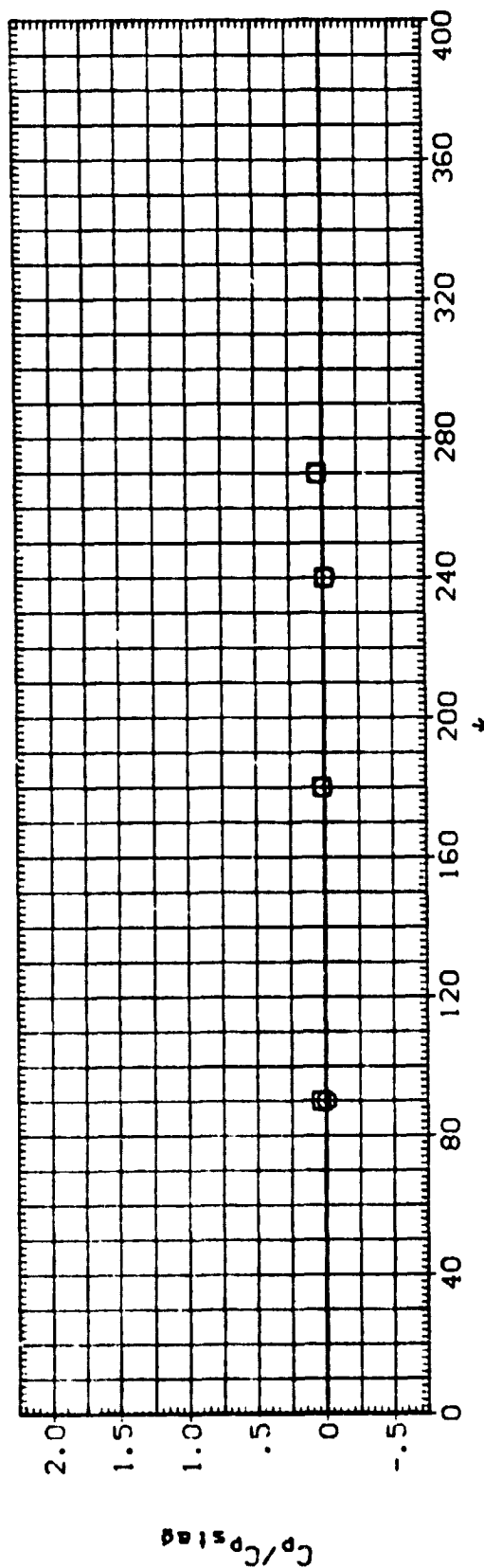


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 1.2

(R038AB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	.000	95.000	2.360	3.000	BETA .000
	5.000	.000			

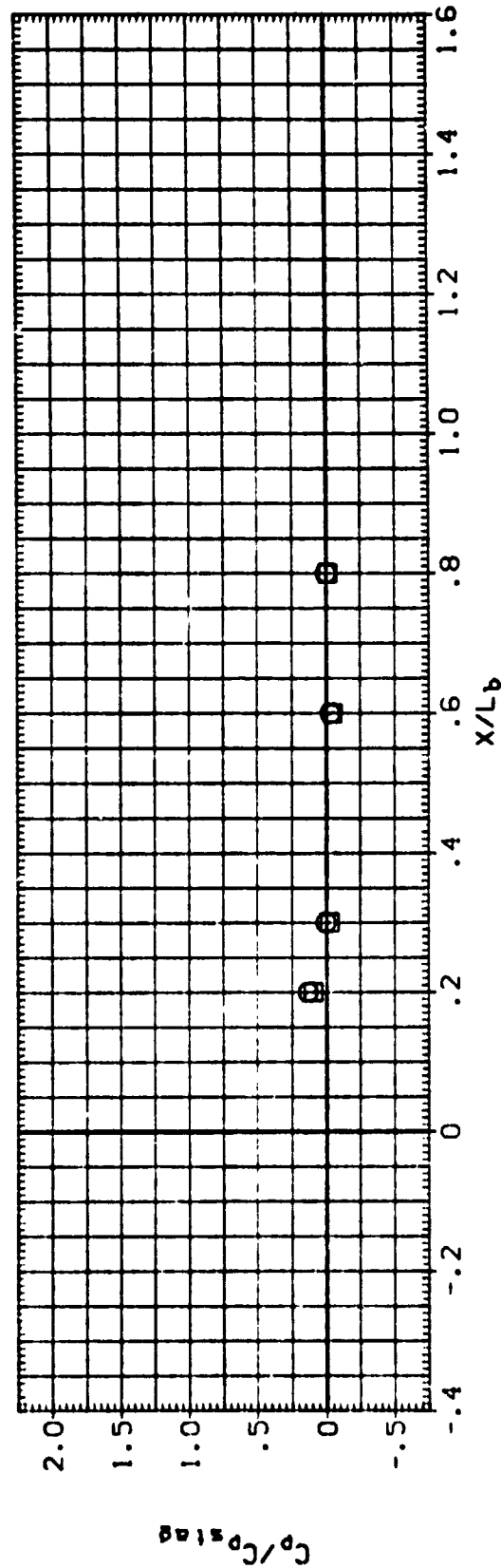
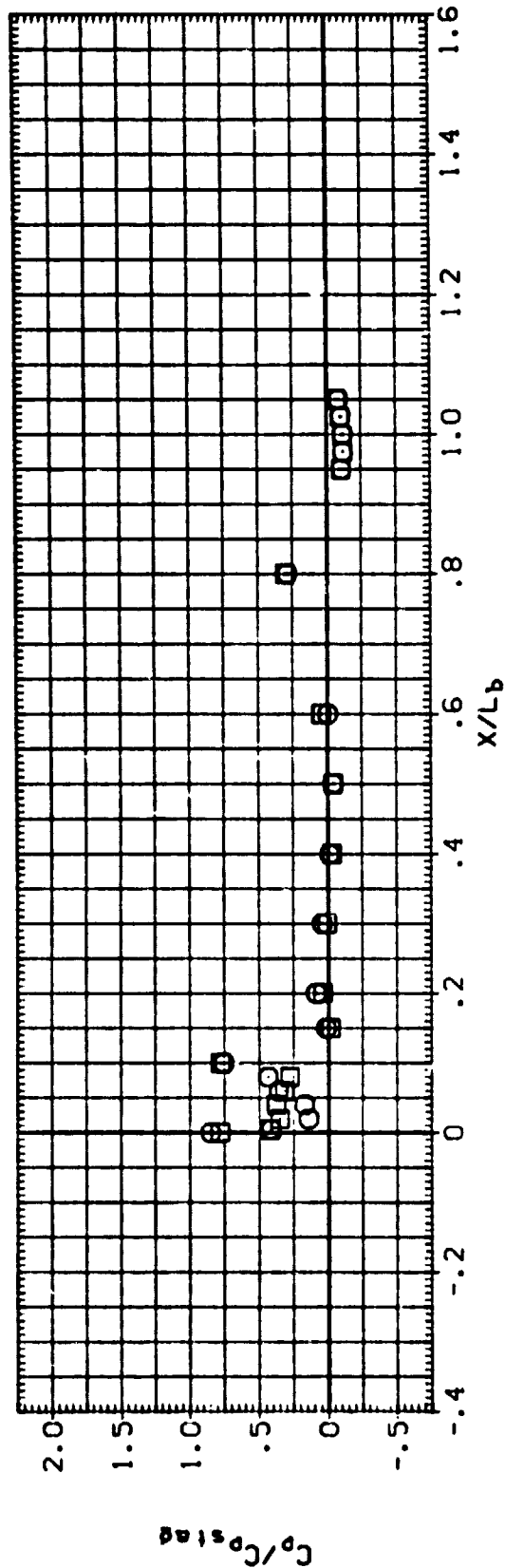


FIG. 16 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(R038AB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PMI	MACH	RN/L	PARAMETRIC VALUES
□	5.000	180.000	2.360		3.000 BETA .000
		122.700			

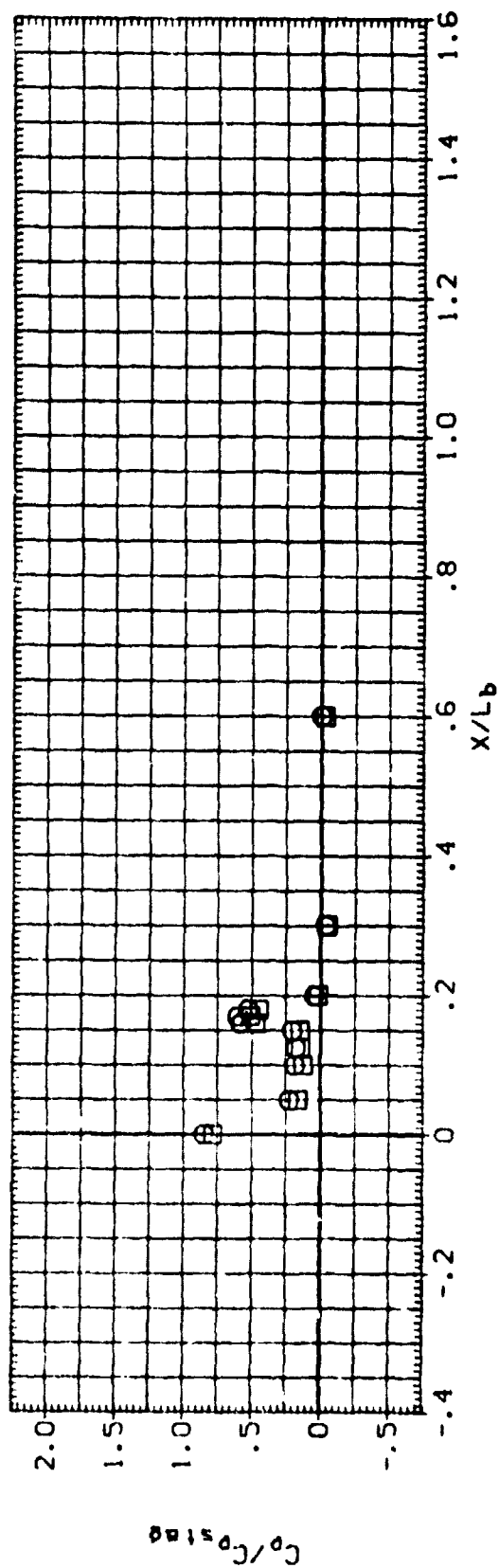
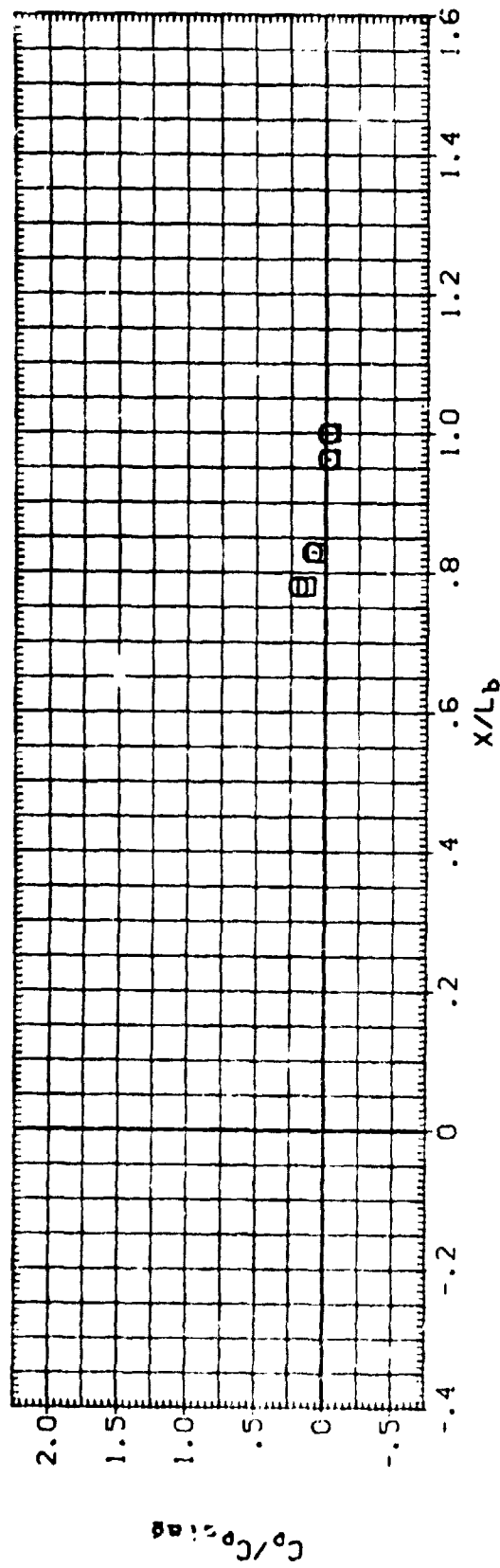


FIG. 15 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(R038AB) UPWT 1059 (IH4) 01-T15-SEN16 ORBITER FUSELAGE

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH
2.95C

PMI
95.000

ALPHA
5.000

SYMBOL

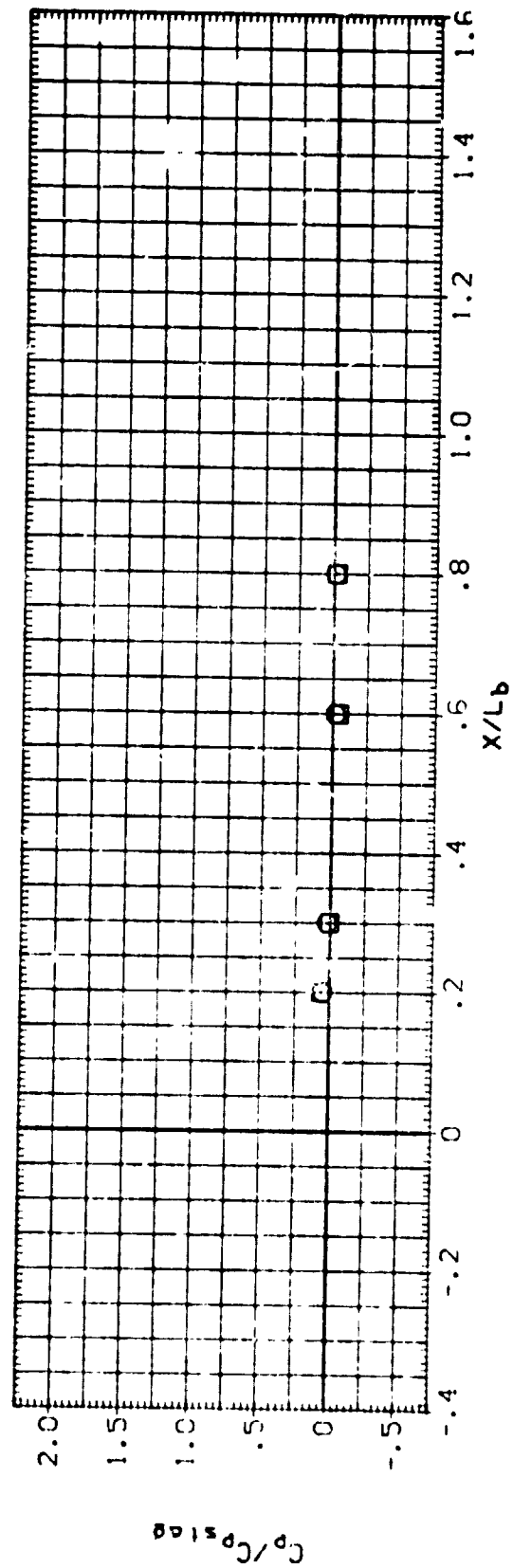
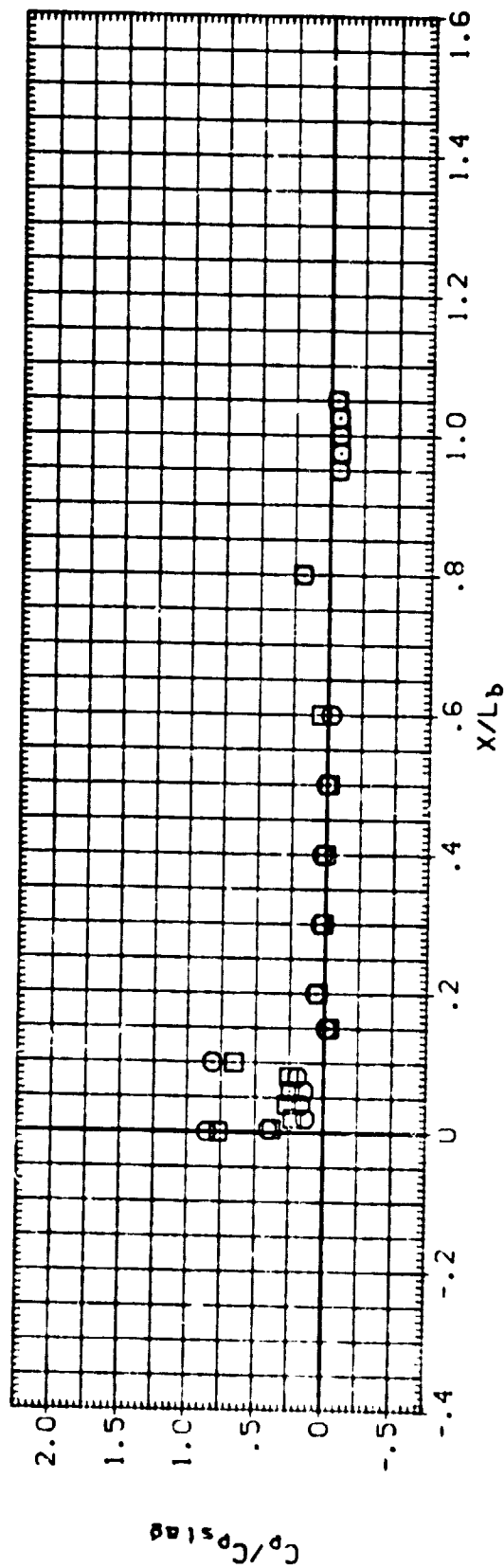


FIG. 16 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA = 0. RN/L = 3.0

(RQ3BAB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH 2.950

ALPHA .000
180.000
5.000 122.700

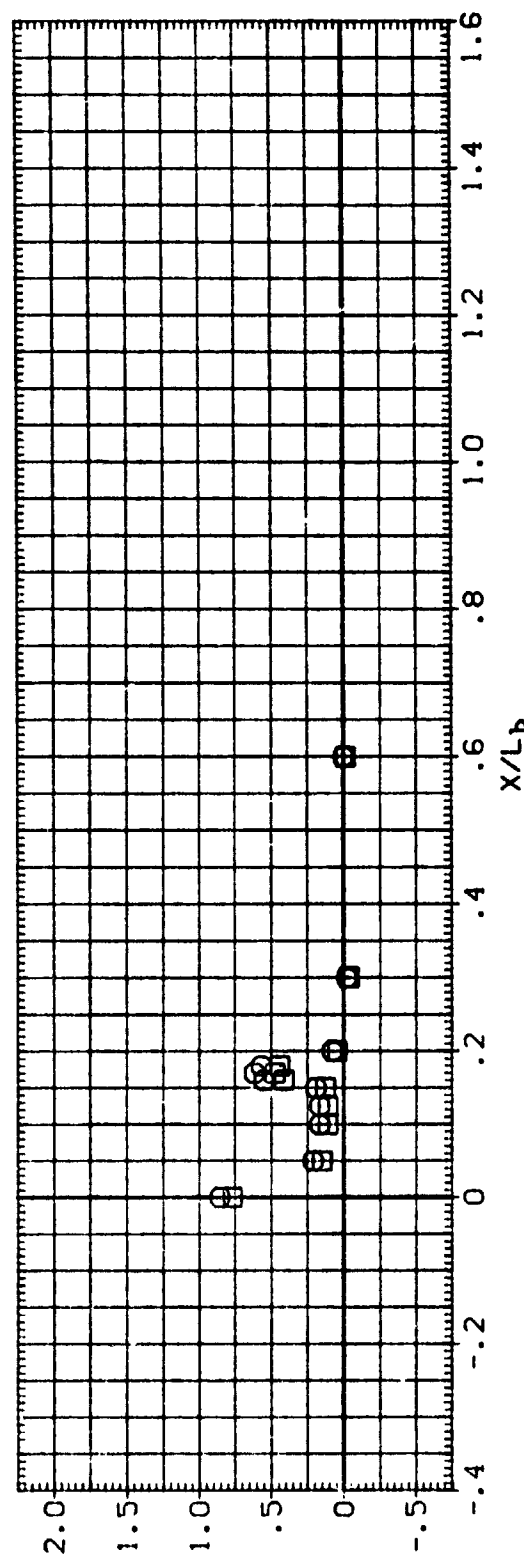
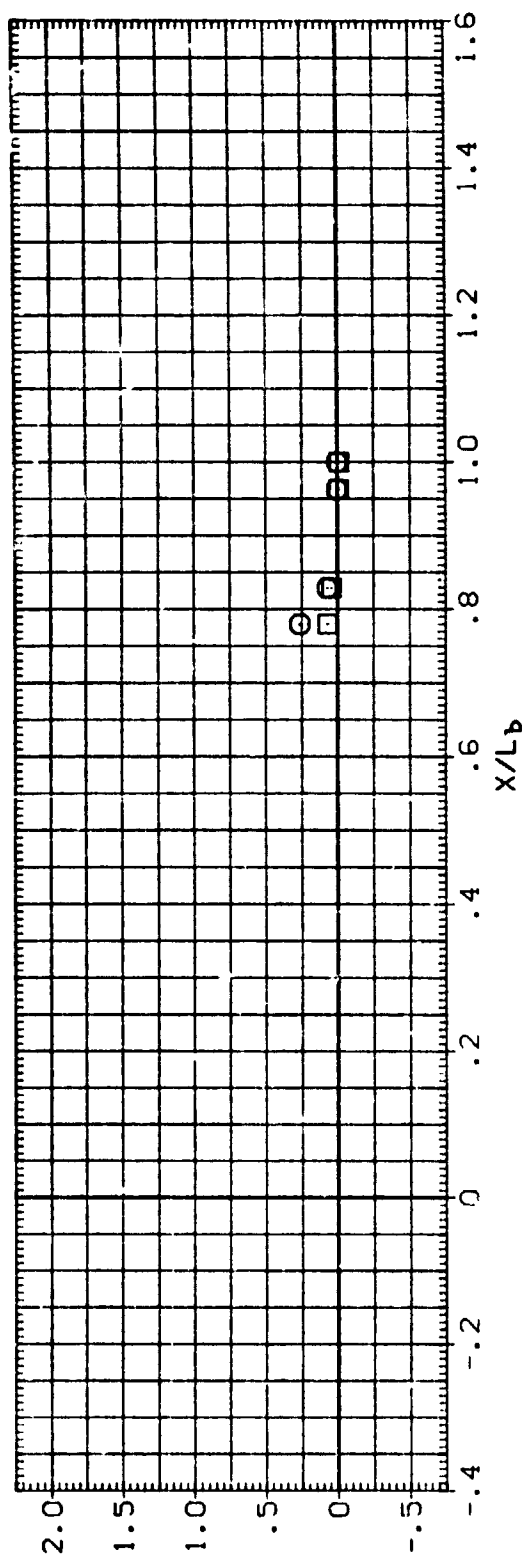


FIG. 16 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

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(R038AB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	-10.000	95.000	3.700		3.000 BETA .000
○	-5.000	.000			
△	5.000				

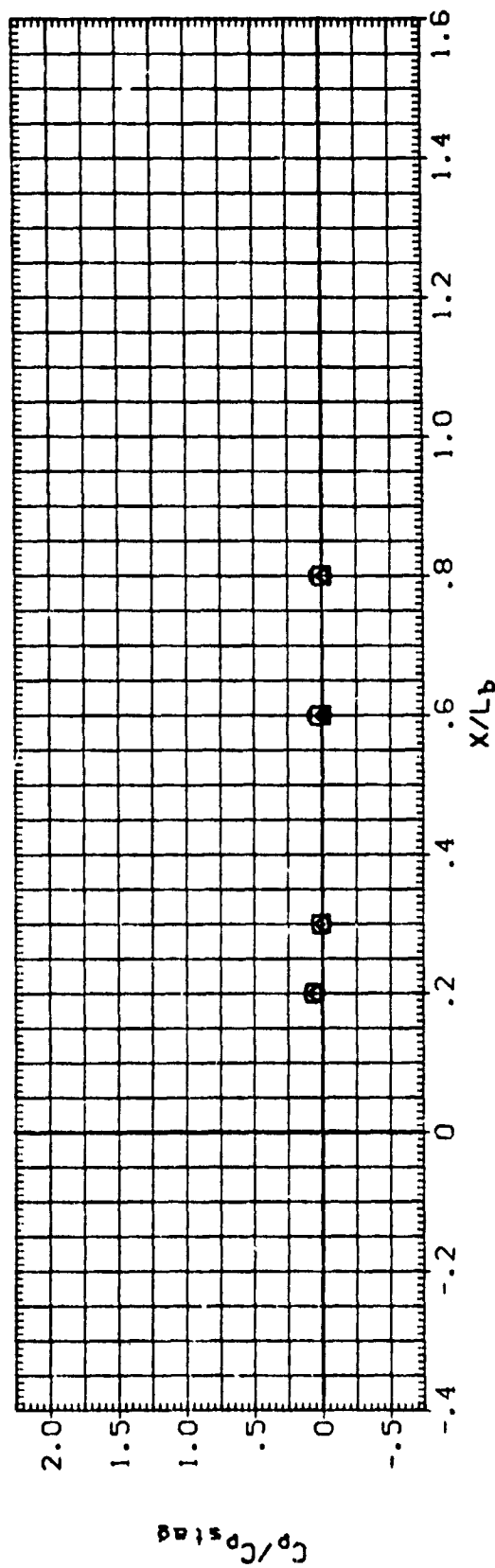
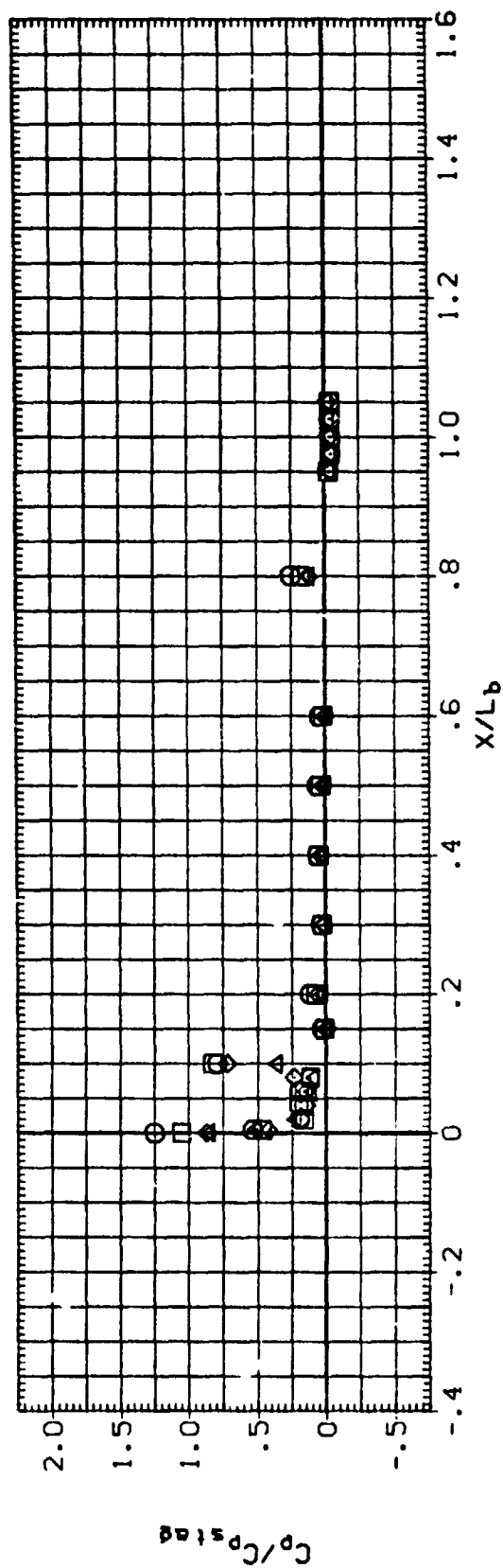


FIG. 16 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

(RQ38AB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

PARAMETRIC VALUES
3.000 BETA .000

MACH 3.700

PHI 180.000
122.700

ALPHA -10.000
-5.000
.000
5.000

SYMBOL    

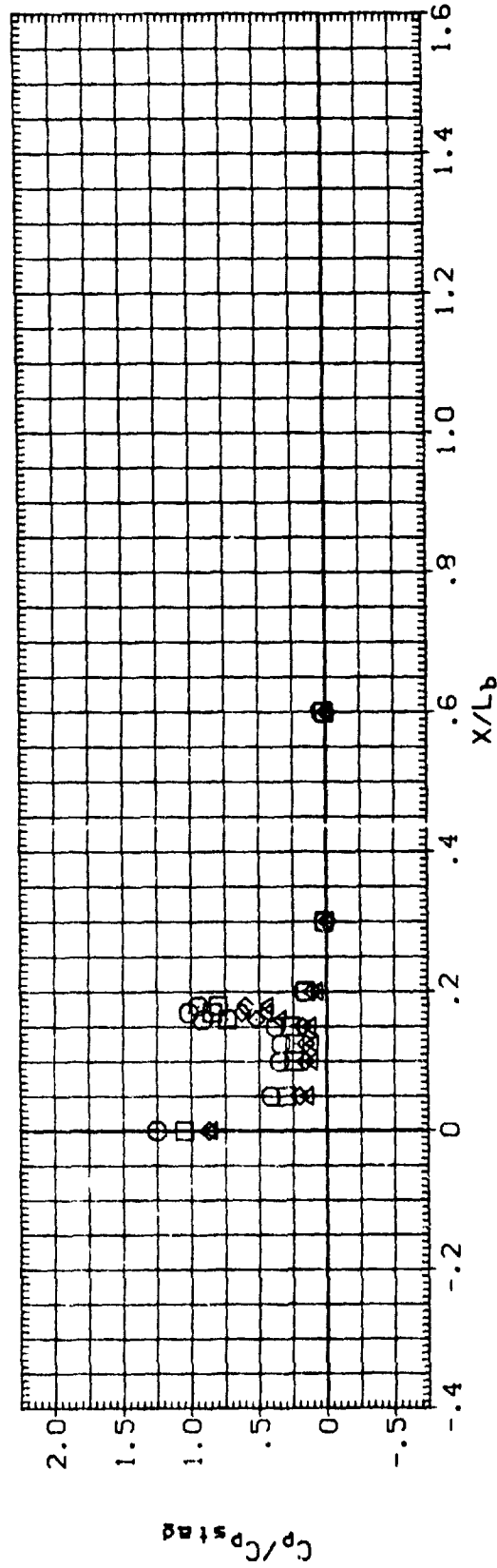
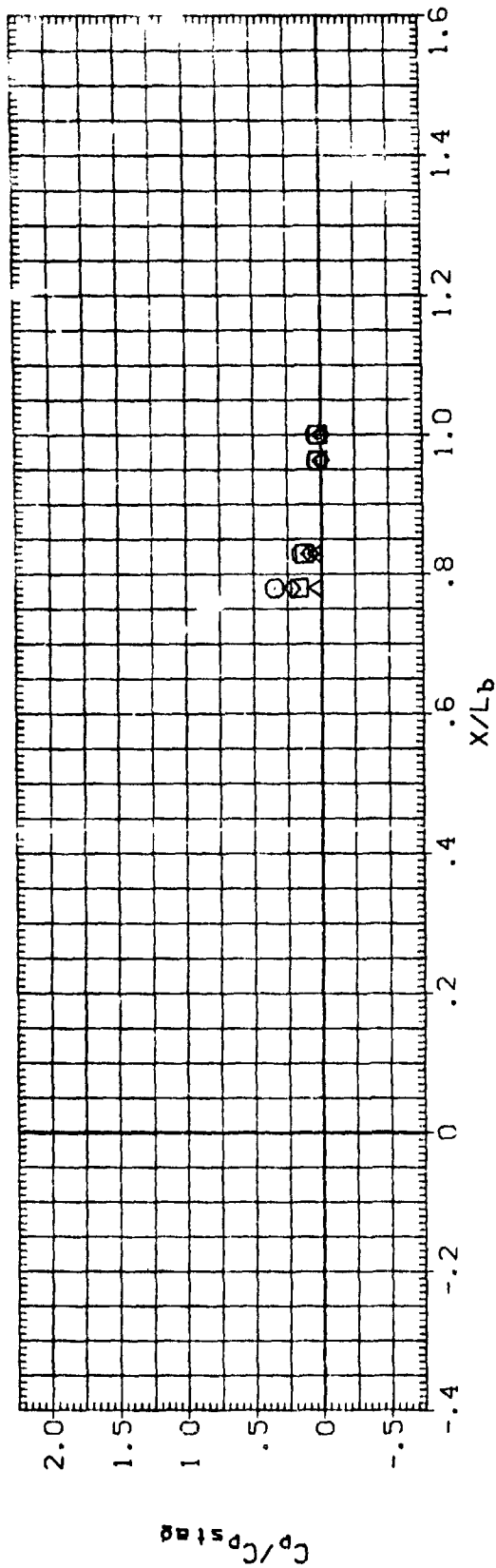


FIG. 16 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER
FUSELAGE. BETA= 0. RN/L= 3.0

(R03BAB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	-10.000	95.000	4.600		3.000 BETA .000
○	-5.000	.000			
△	5.000				

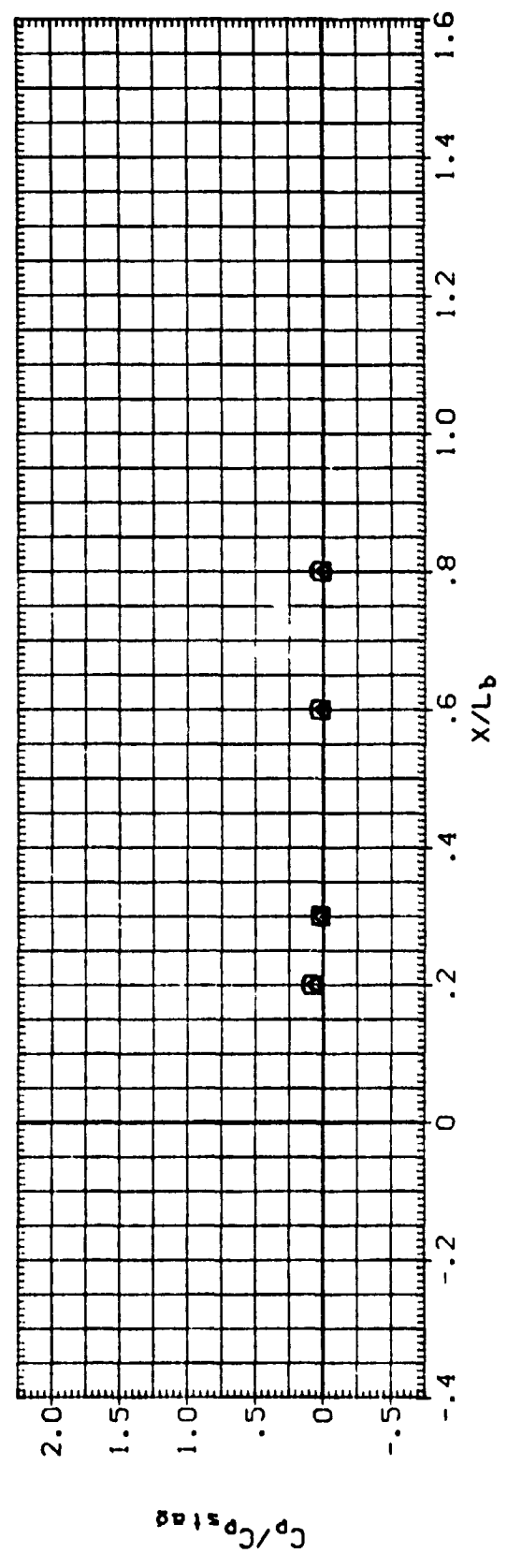
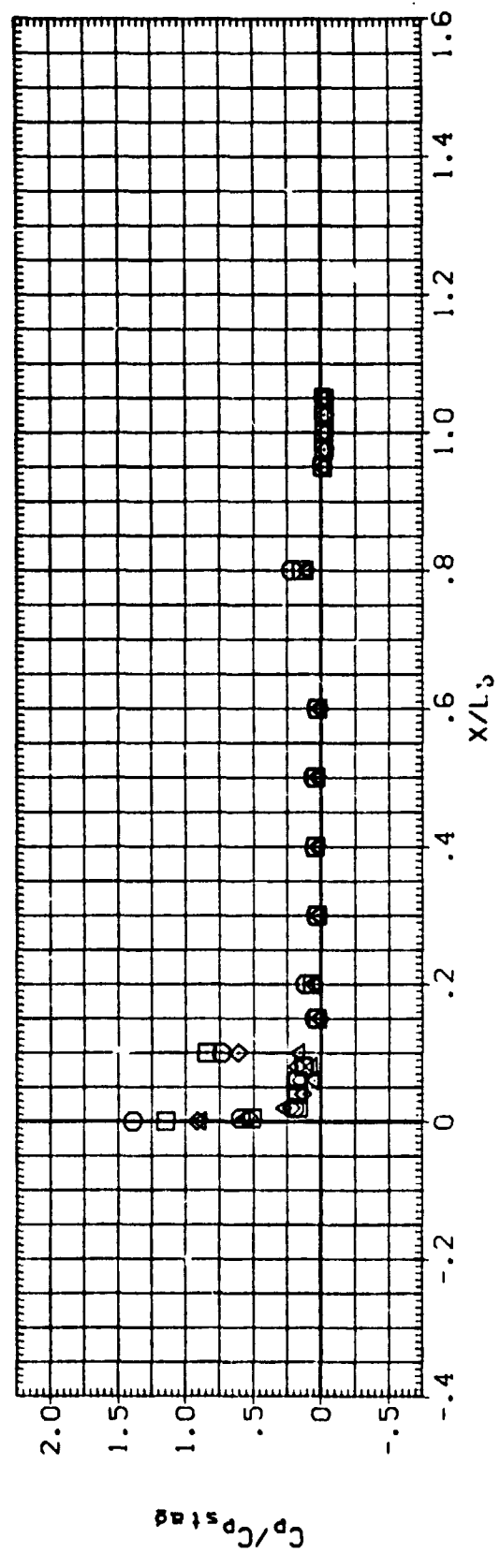


FIG. 16 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(R038AB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA PH1 MACH
 -10.000 180.000 4.500
 -5.000 122.700
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

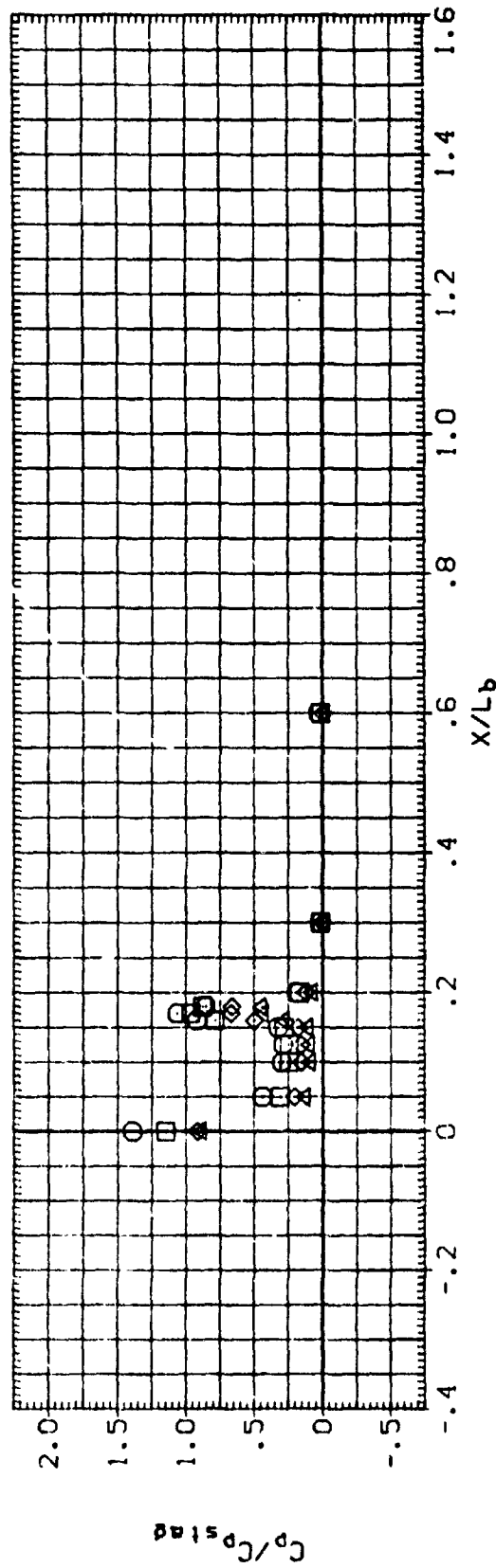
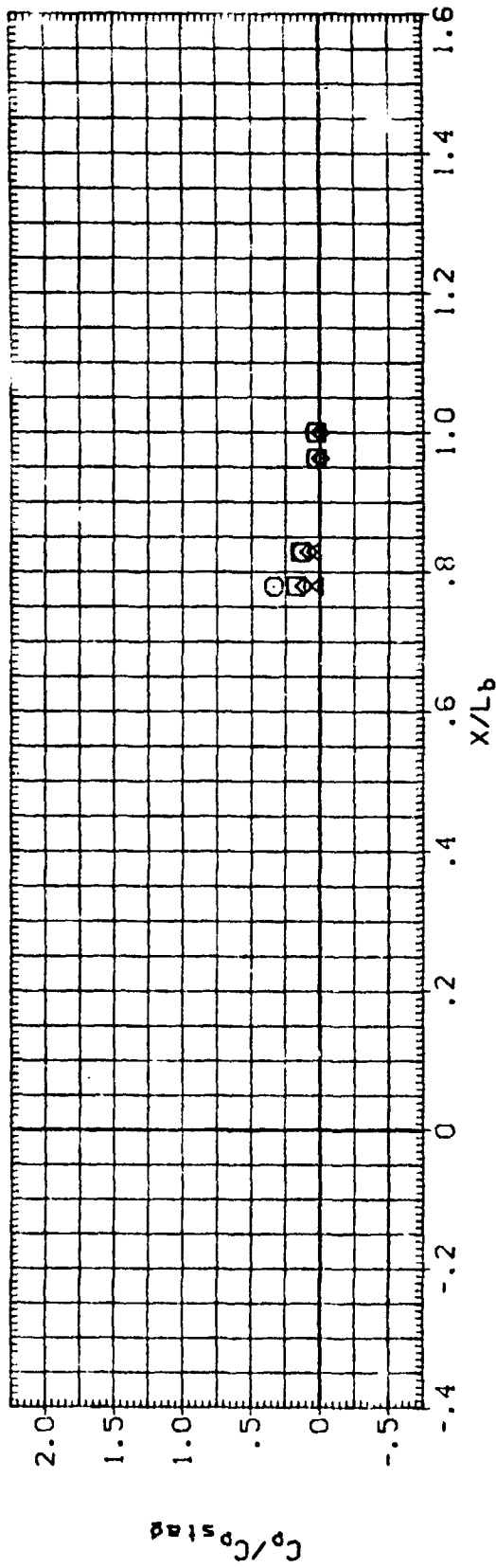


FIG. 16 VARIATION OF C_P/C_Ps ON THE INTEGRATED VEHICLE WITH T15, ORBITER FUSELAGE. BETA= 0, RN/L= 3.0

(R038AB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

MACH

X/LB

ALP-IA

SYMBOL

2.360

.600

.000

5.000

RN/L

PARAMETRIC VALUES

3.000

BETA

.000

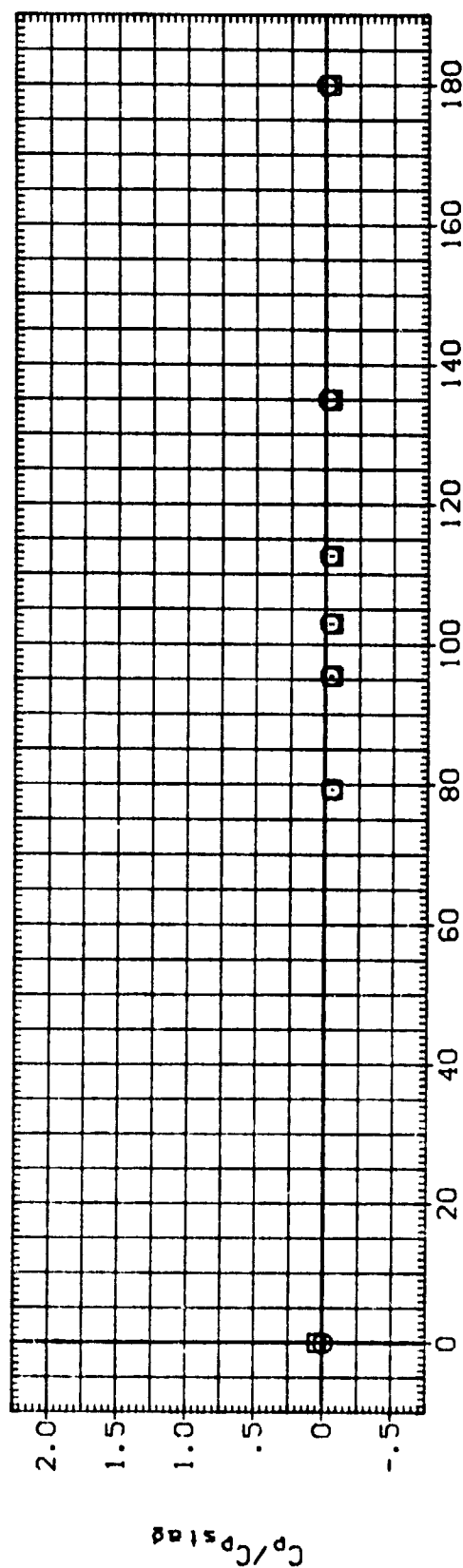
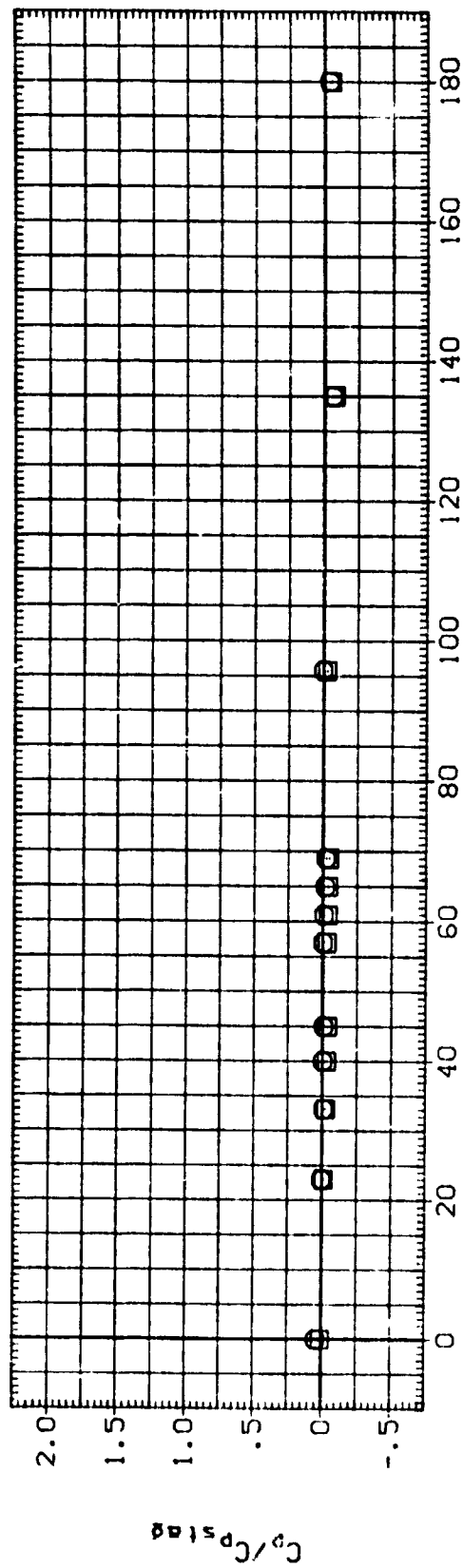


FIG. 16 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0, RN/L= 3.0

D

(RQ38A8) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
8	.000	.200	2.950		3.000 BETA .000
	5.000	.100			

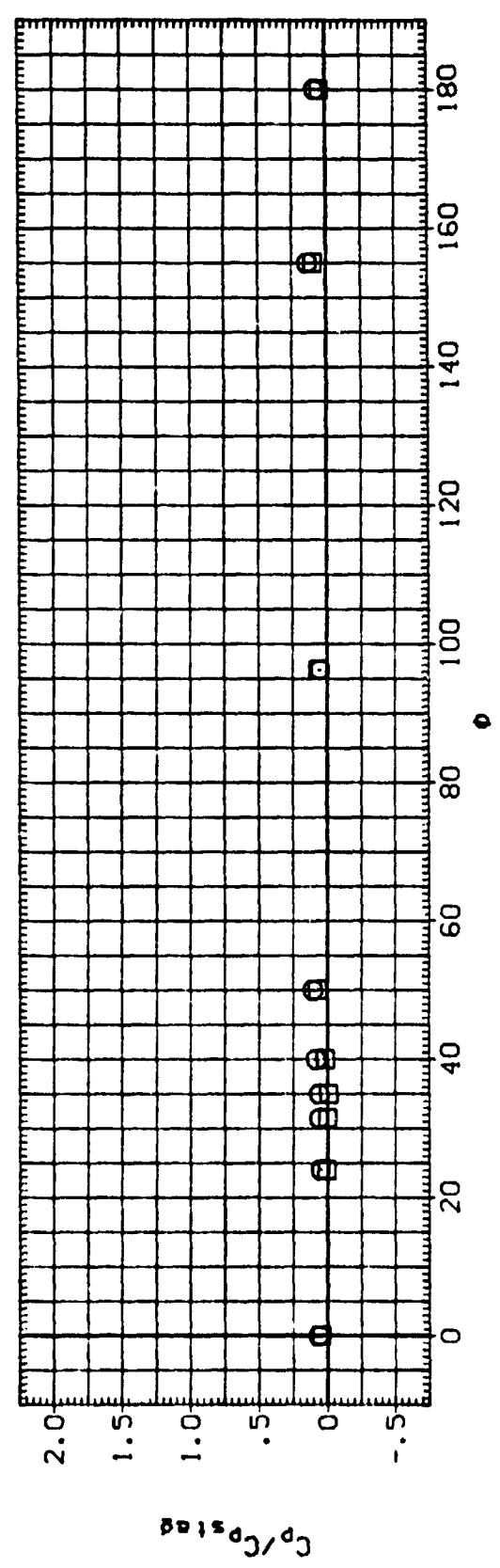
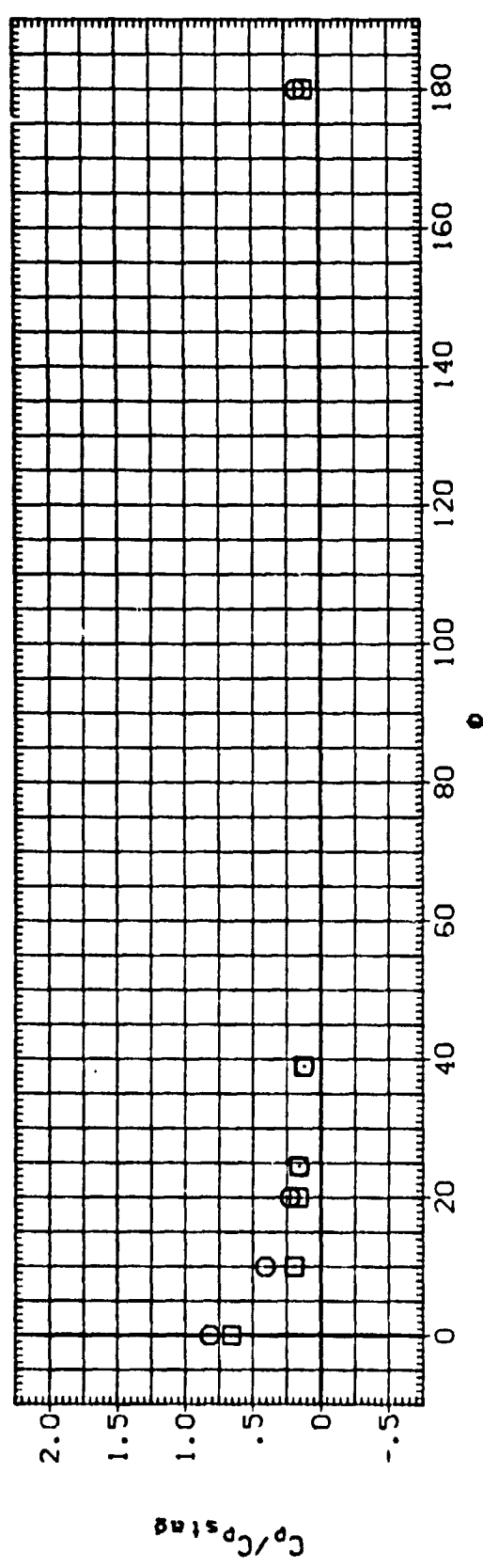


FIG. 16 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(RQ38AB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA X/LB MACH
 □ .000 .600 2.950
 □ .5.000 .300

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

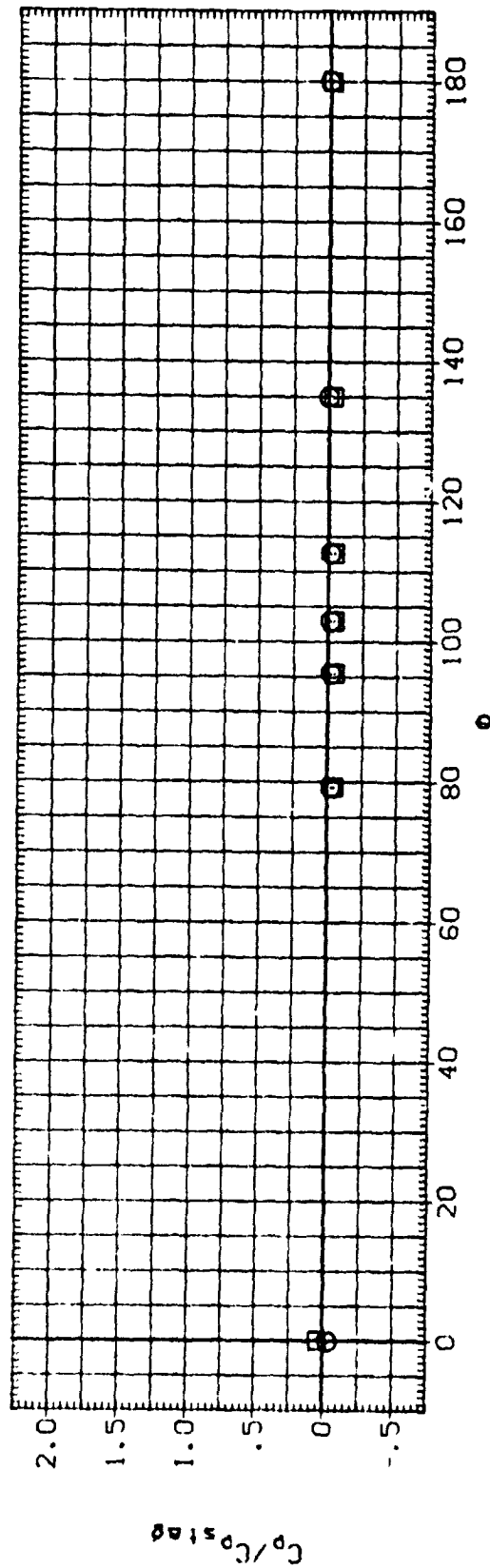
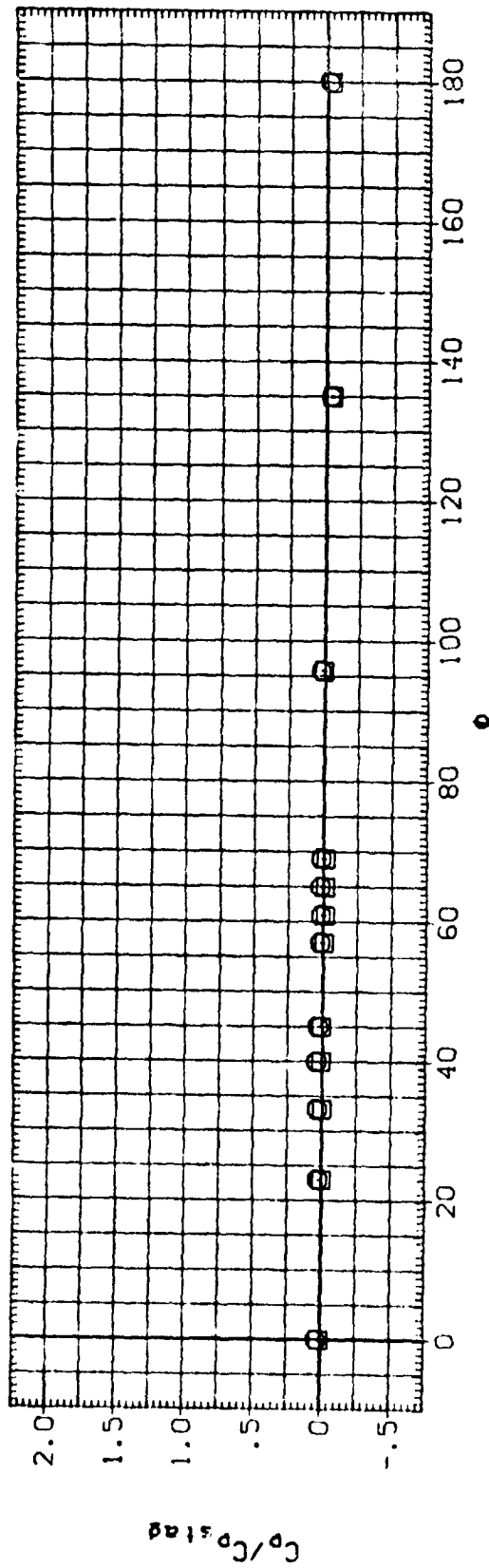


FIG. 16 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(R038AB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA
 X/LB
 MACH
 -10.000
 -5.000
 -1.000
 5.000

X/LB
 .200
 .100

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

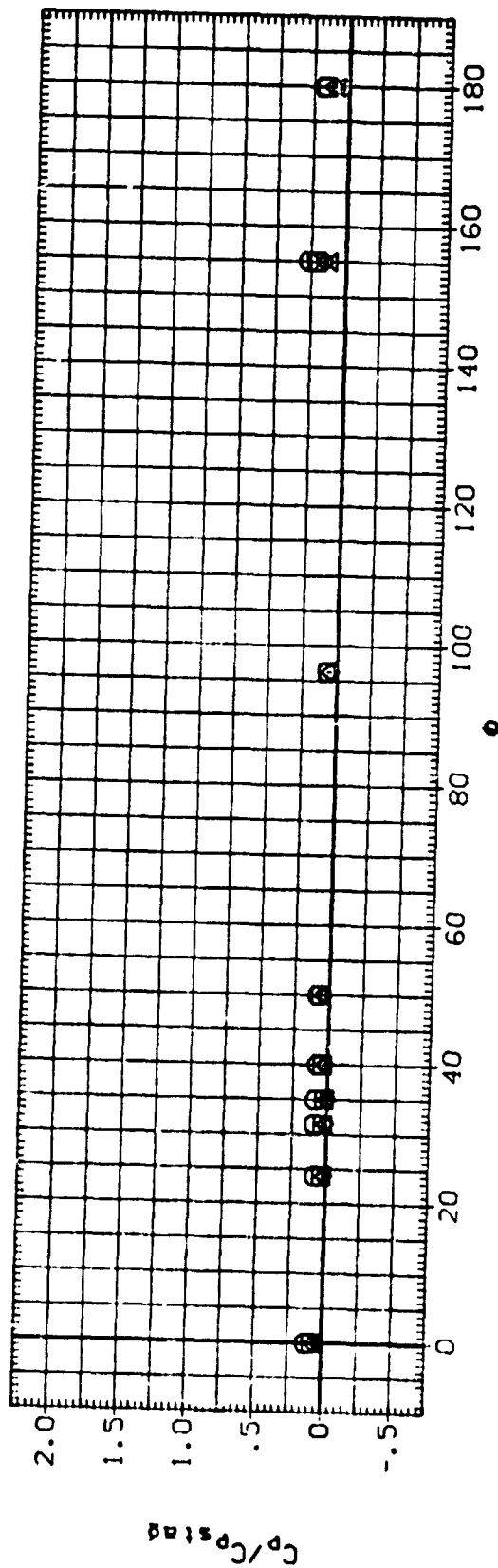
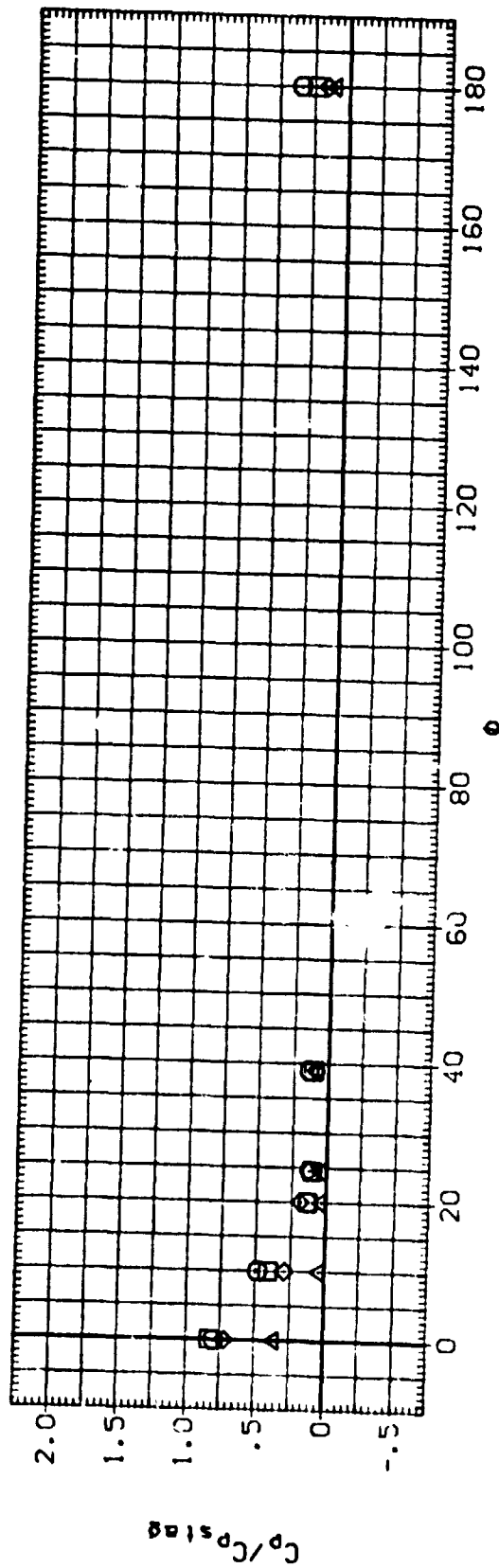


FIG. 16 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA = 0. RN/L = 3.0

(RQ38AB) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
	-10.000	.600	3.700		3.000 BETA
	-5.000	.300			.000
	.000				
	5.000				

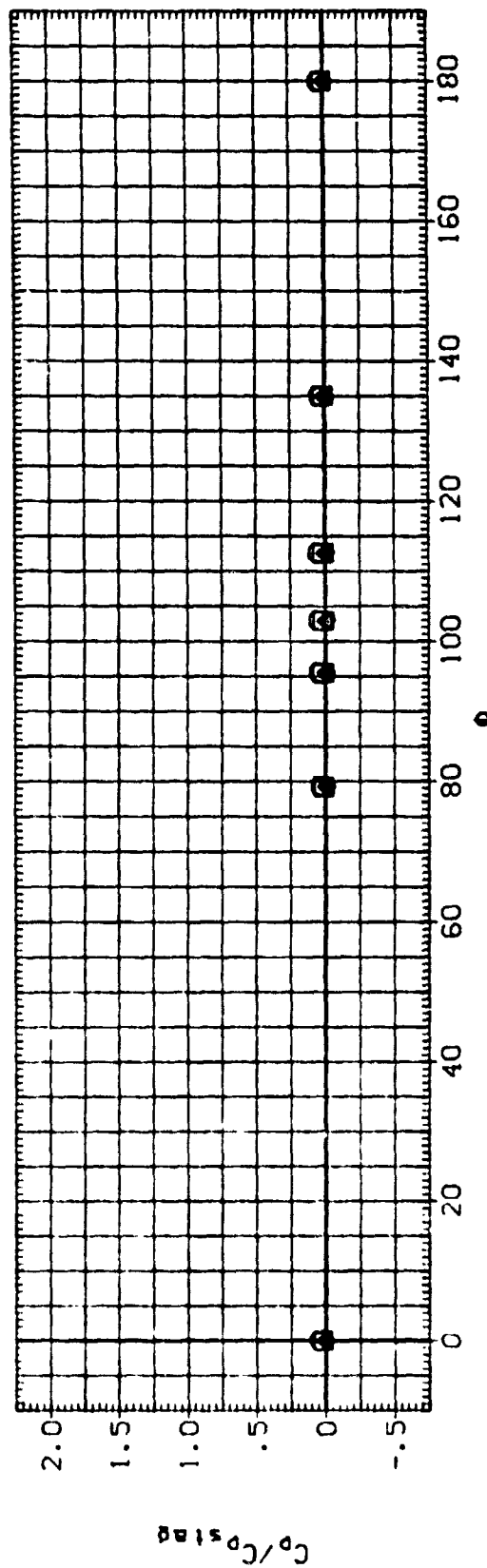
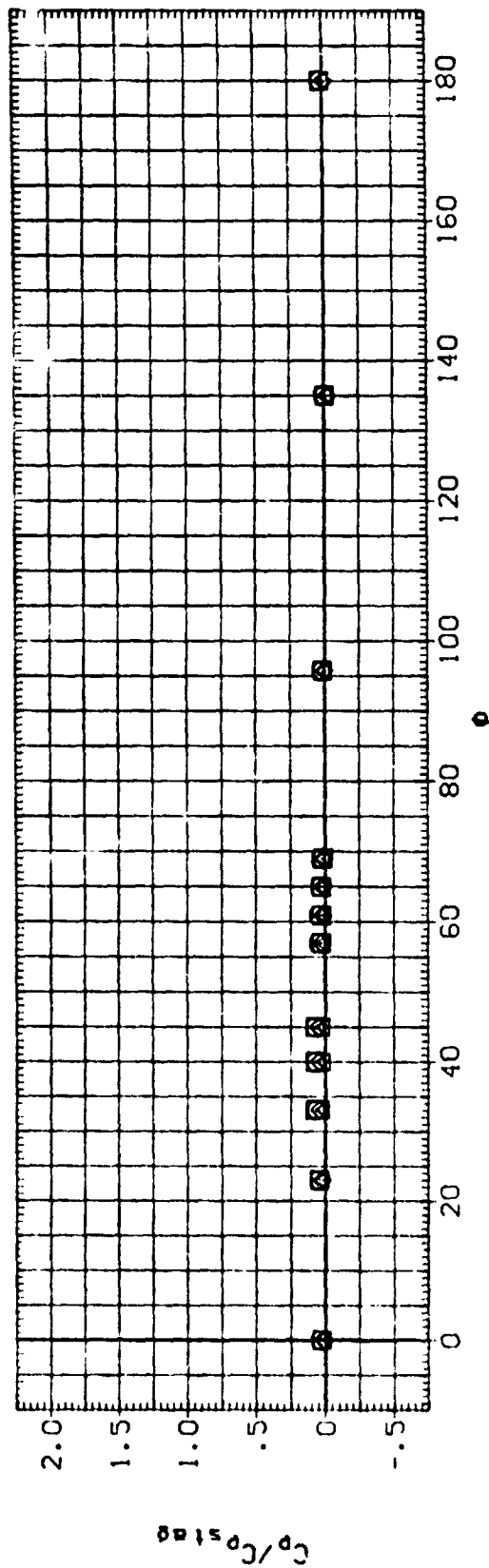


FIG. 16 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

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(RQ3B8B) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	K/LB	MACH	RM/L	PARAMETRIC VALUES
	-10.000	.200	4.600		3.000 BETA
	-5.000	.100			.000
	.000				
	5.000				

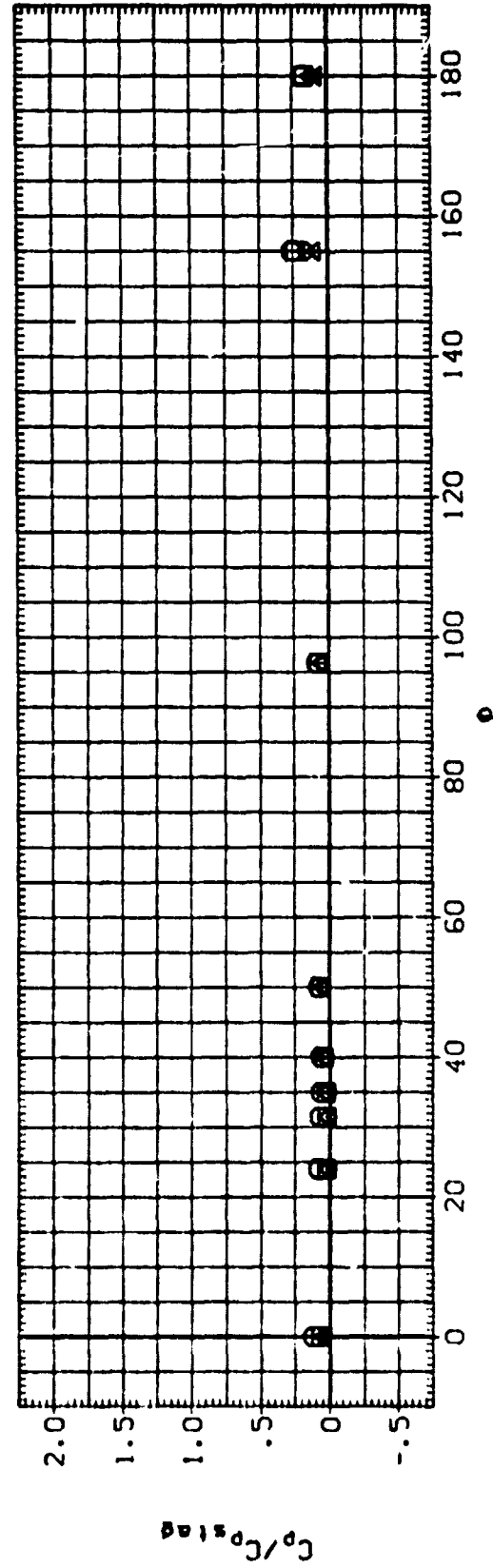
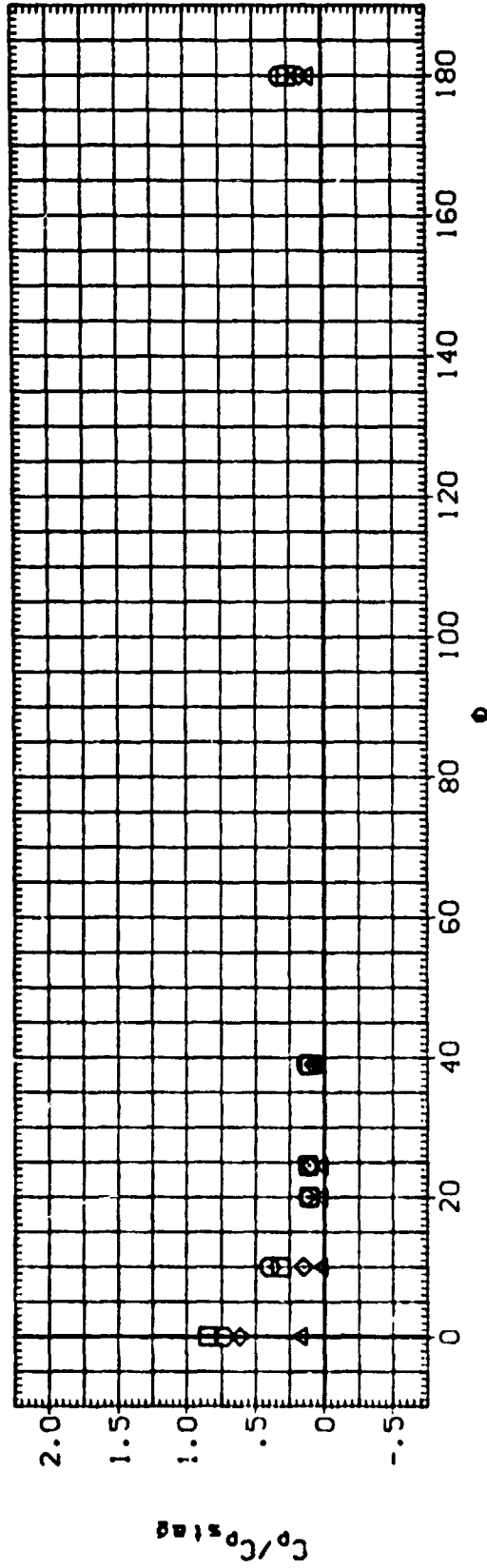


FIG. 16 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(R038AB) SYMBOL ALPHA
 -10.000
 -5.000
 .000
 5.000

UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

A/LB .600
 MACH 4.600

RN/L
 PARAMETRIC VALUES
 3.000 BETA .000

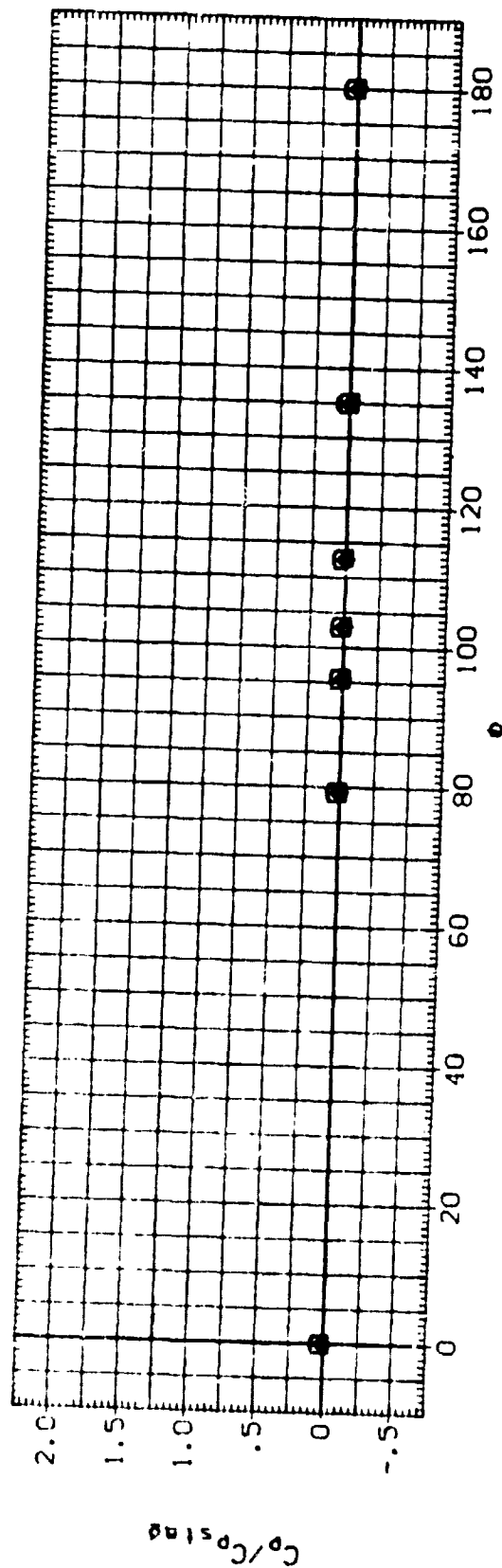
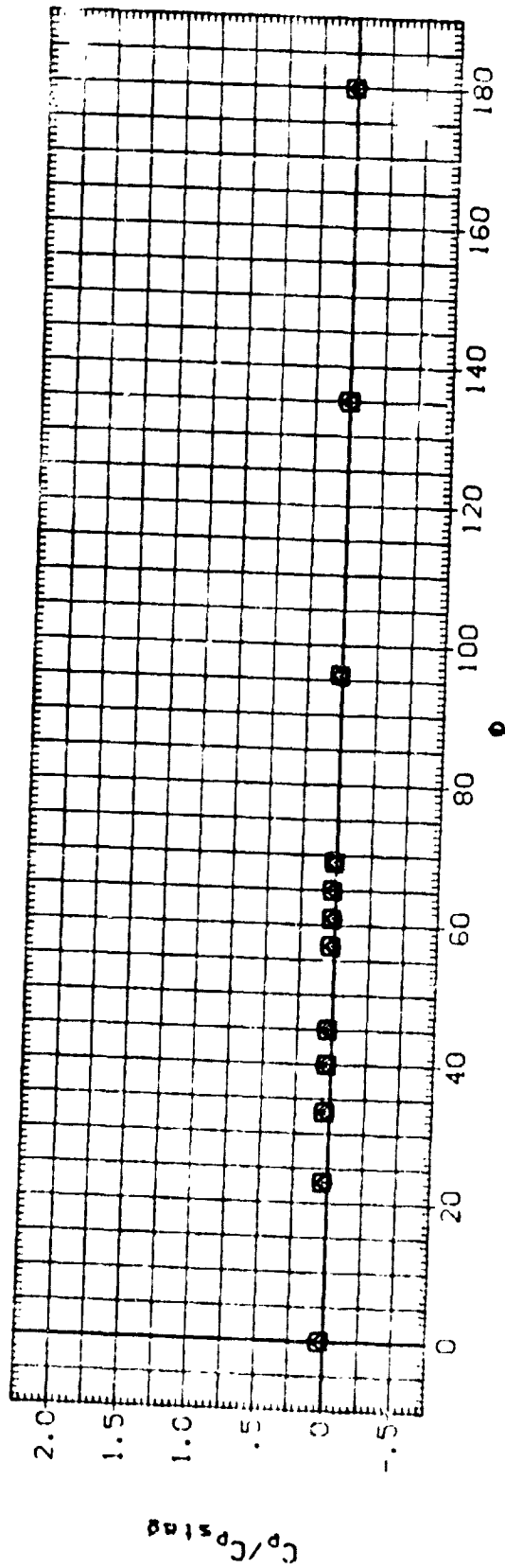


FIG. 16 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(RQ3LAB) UPWT 1059 (1H4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/8V MACH
 .000 .400 2.360
 5.000 .250

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

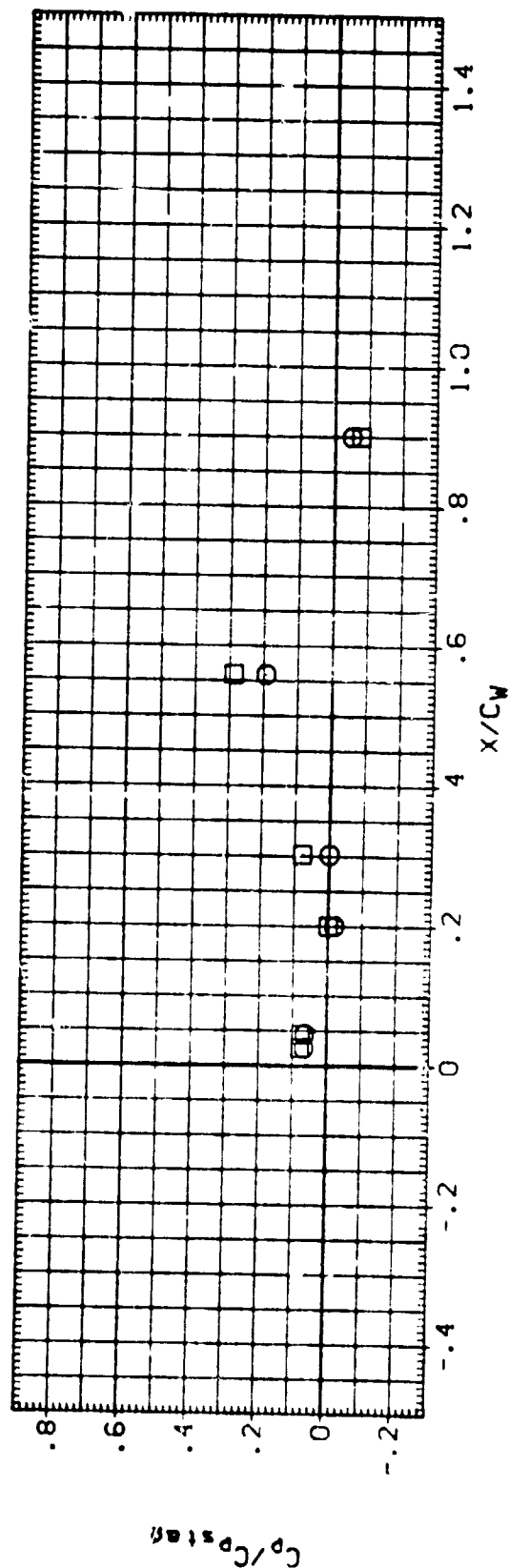
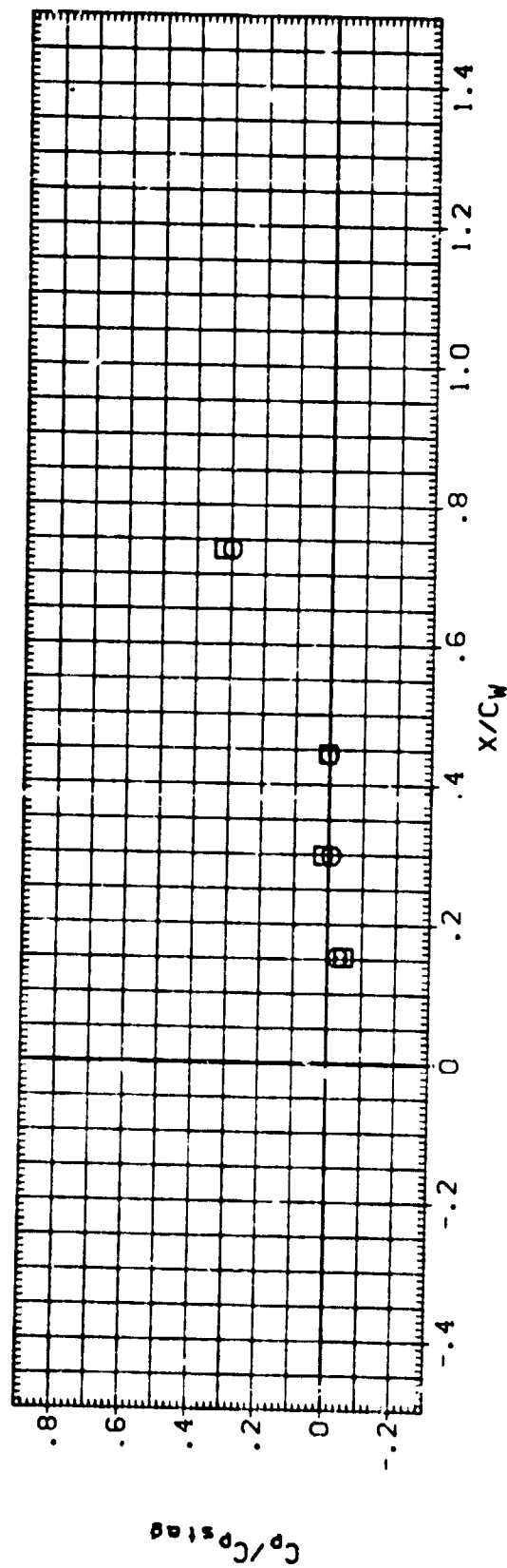


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

SYMBOL ALPHA .000 .500 .000 .500

2Y/8V MACH 2.360

PARAMETRIC VALUES RN/L 3.000 BETA .000

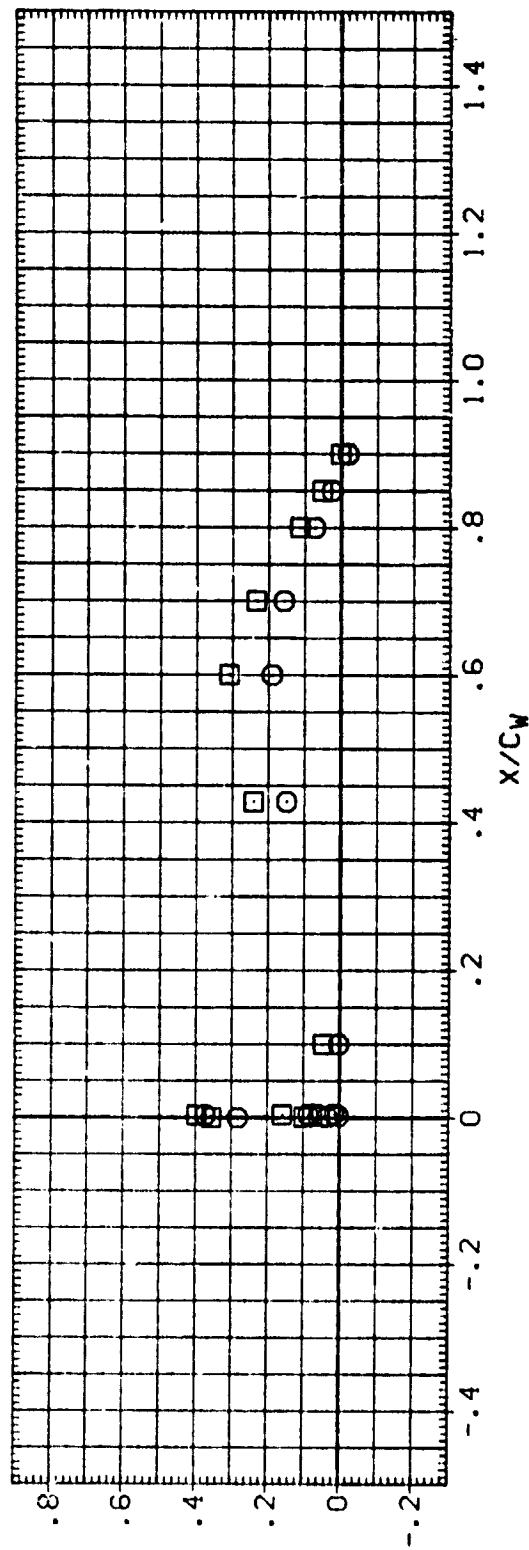
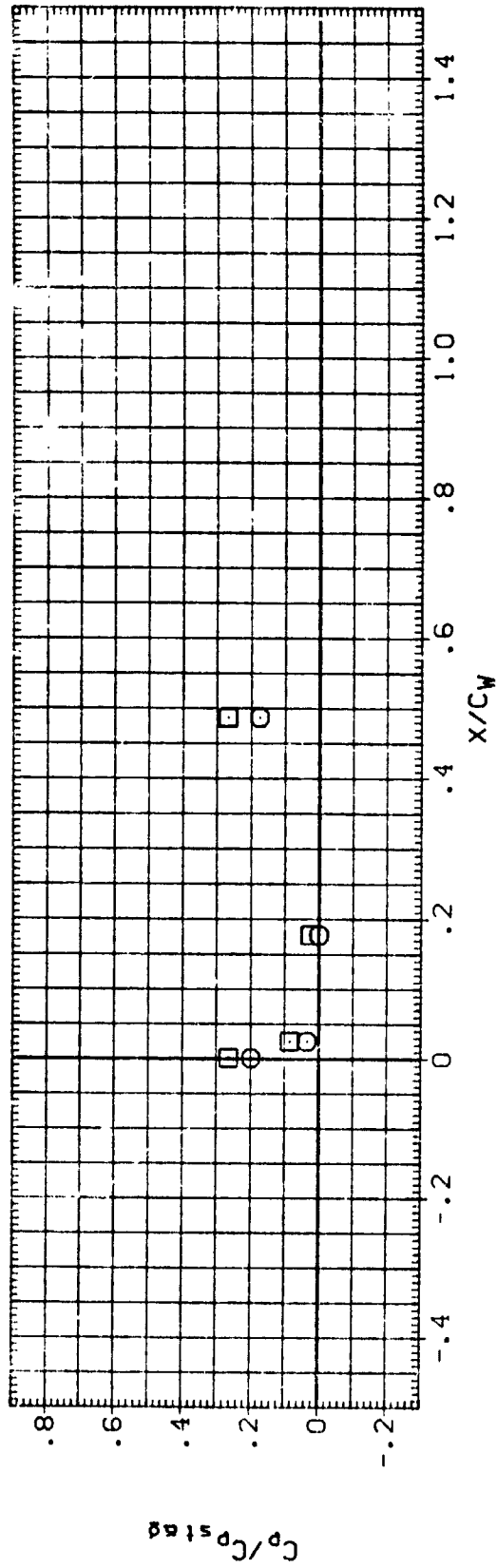


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(RQ3LAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2Y/BW	MACH	RN/L	PARAMETRIC VALUES
□	5.000	.850	2.360		3.000 BETA .000

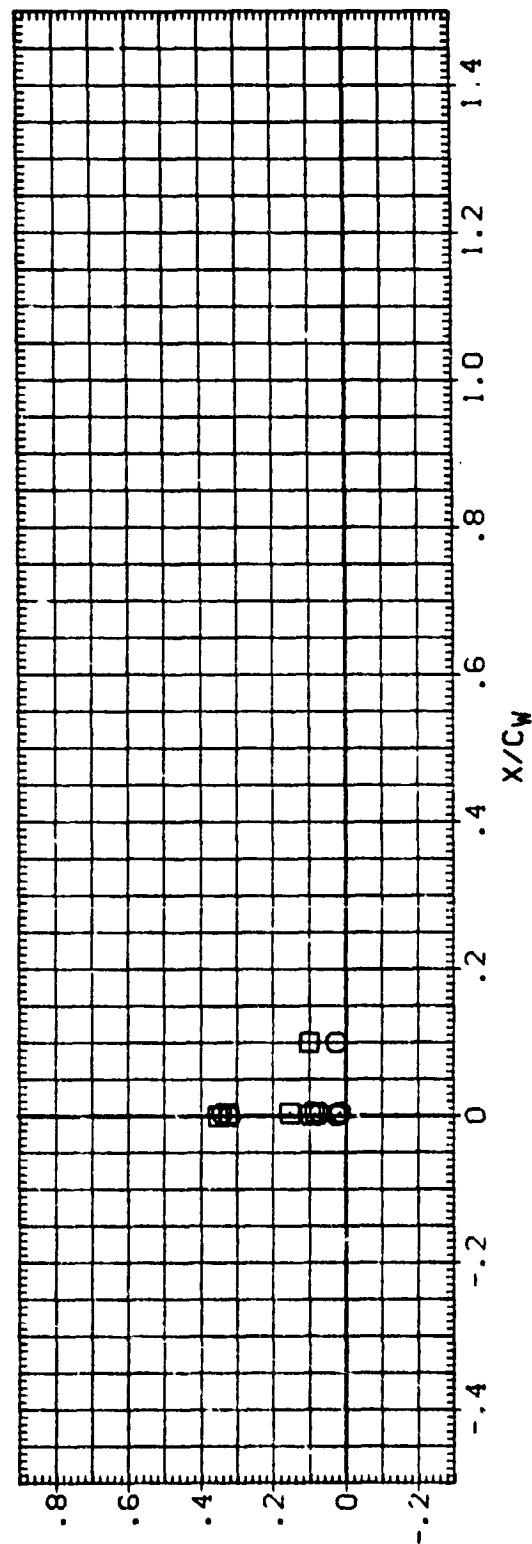
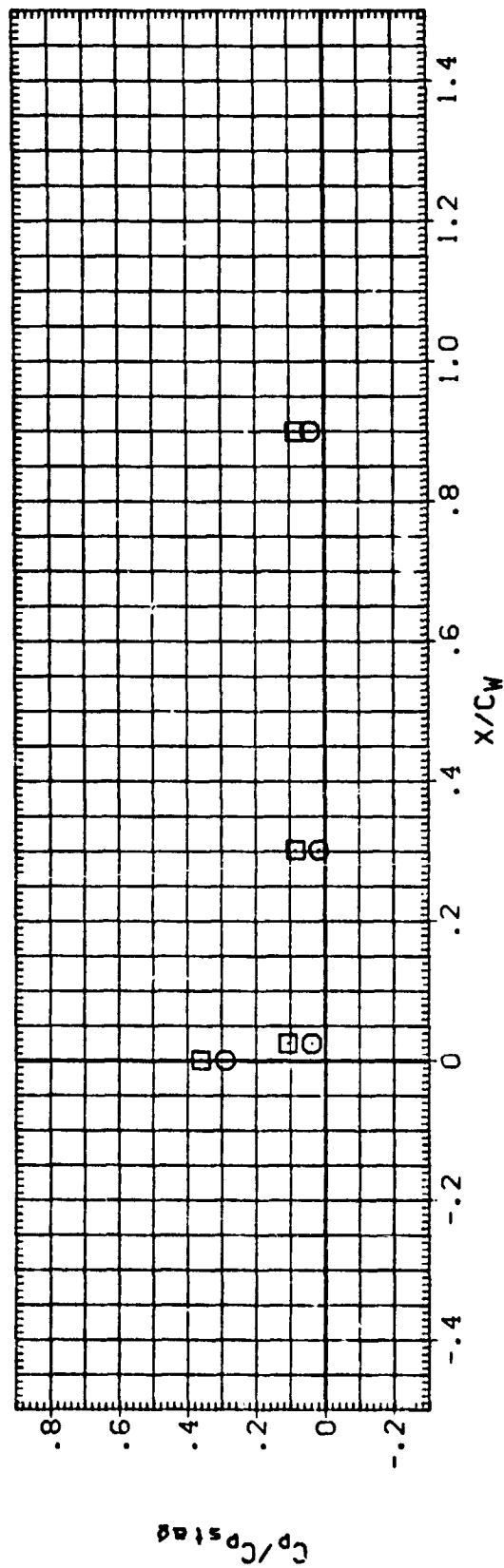


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER LOWER WING. BETA= 0, RN/L= 3.0

(R03LAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/8V MACH
 5.000 .000 .400 2.950
 .250

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

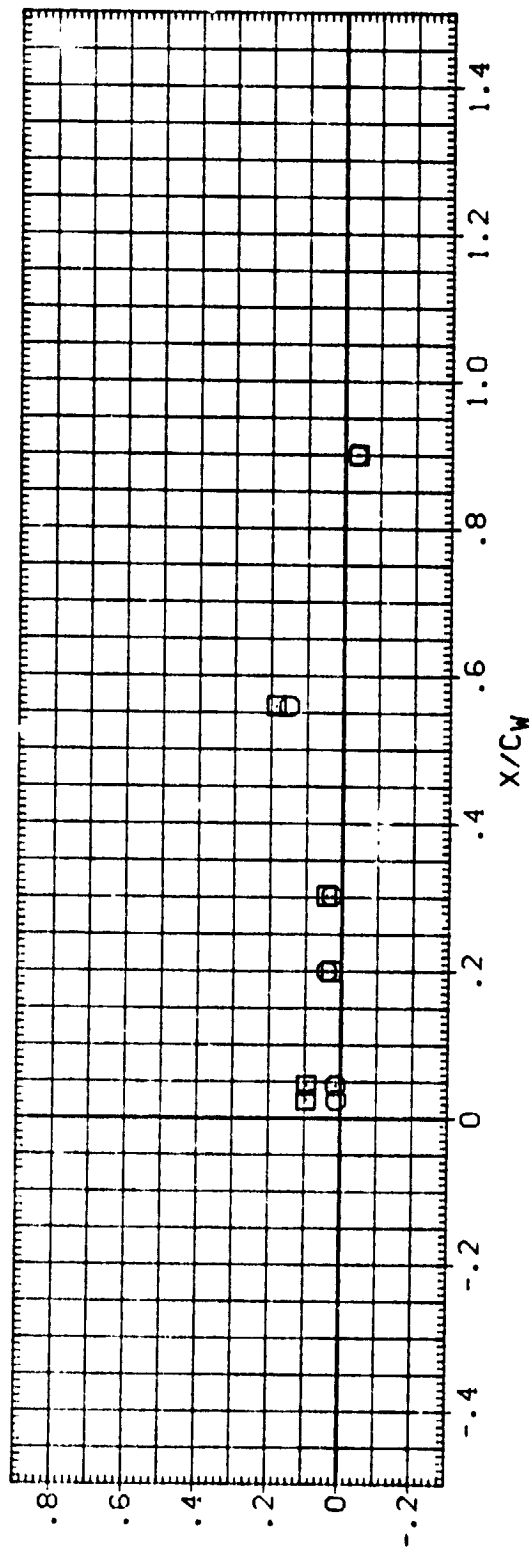
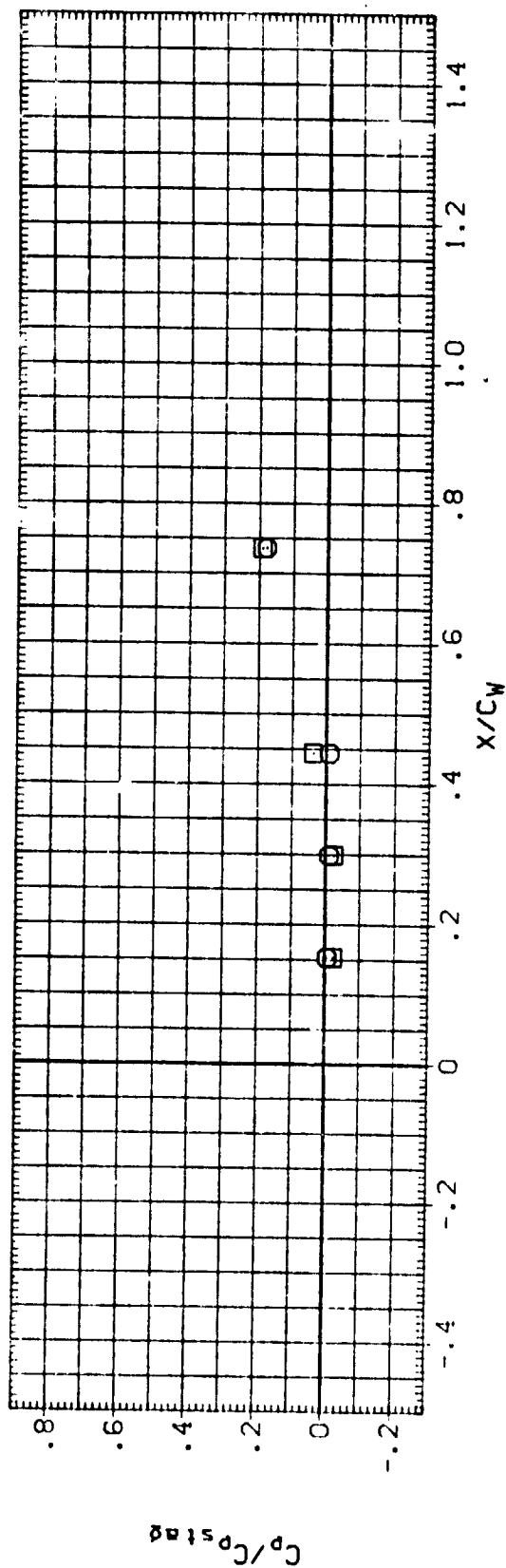


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(RQ3LAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2Y/8V	MACH	RN/L	PARAMETRIC VALUES
□	.000	.600	2.950		3.000 BETA .000
□	.500				

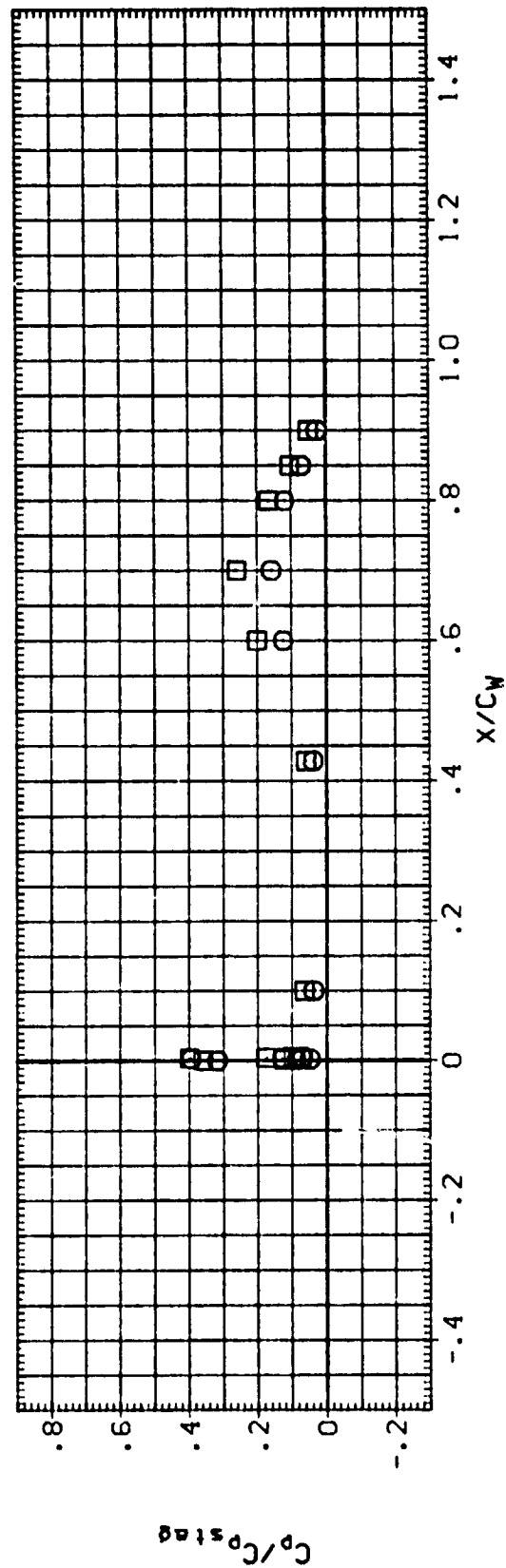
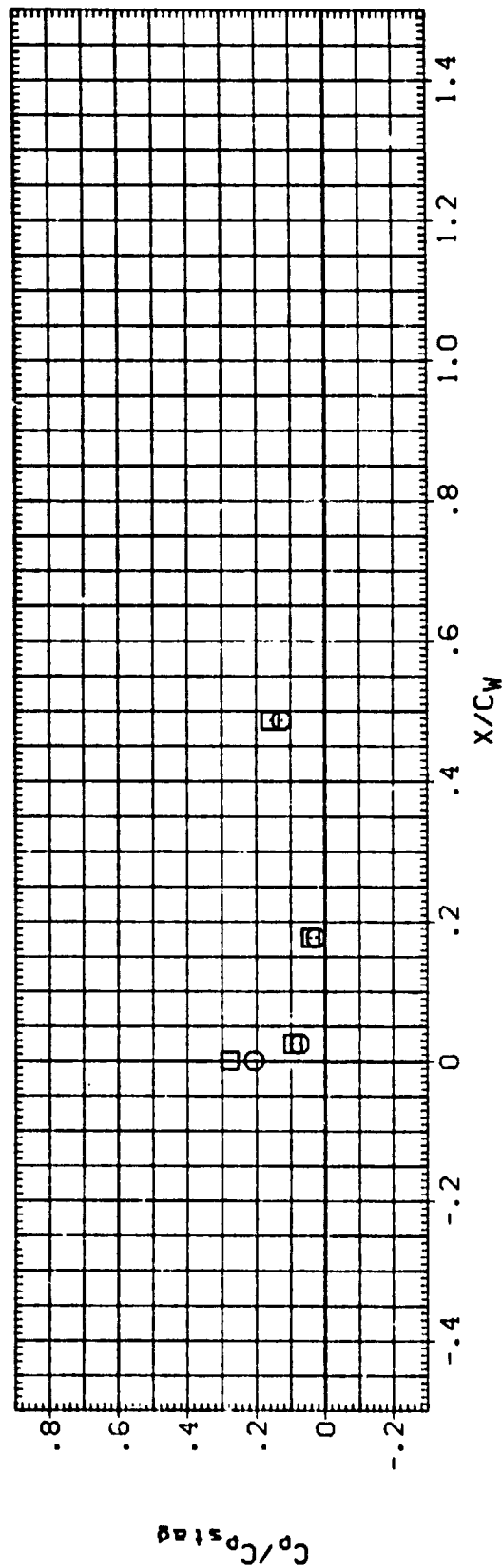


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(RQ3LAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/8W M²/CH 950
 5.000 .850 .750

PARAMETRIC VALUES
 3.000 BETA .000

RN/L

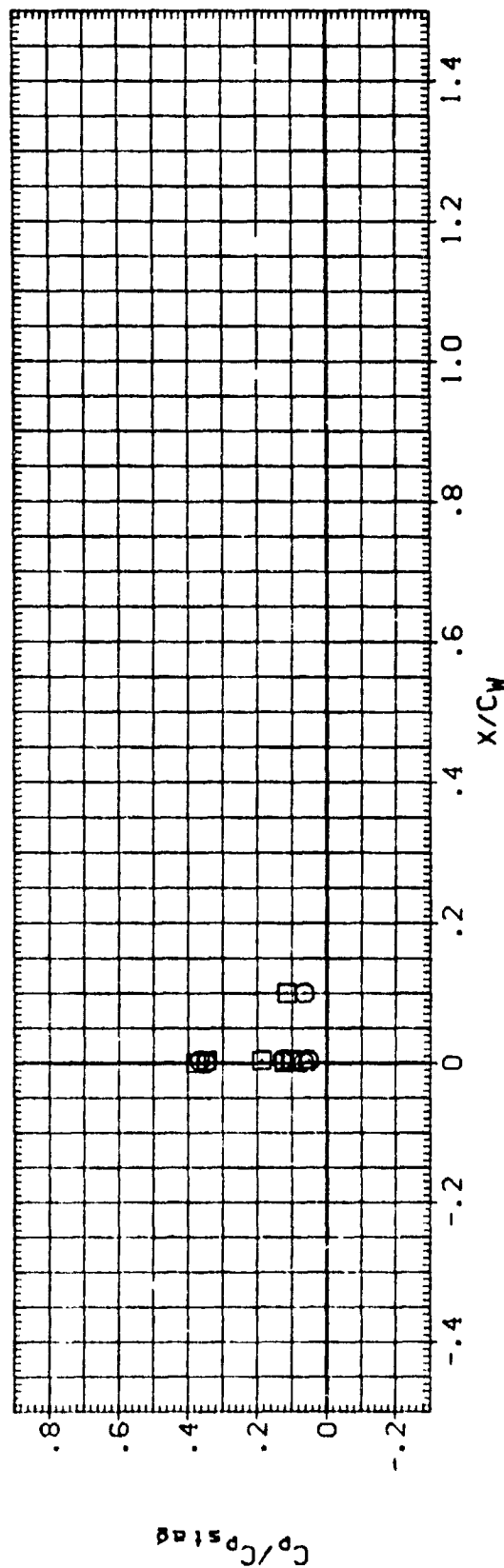
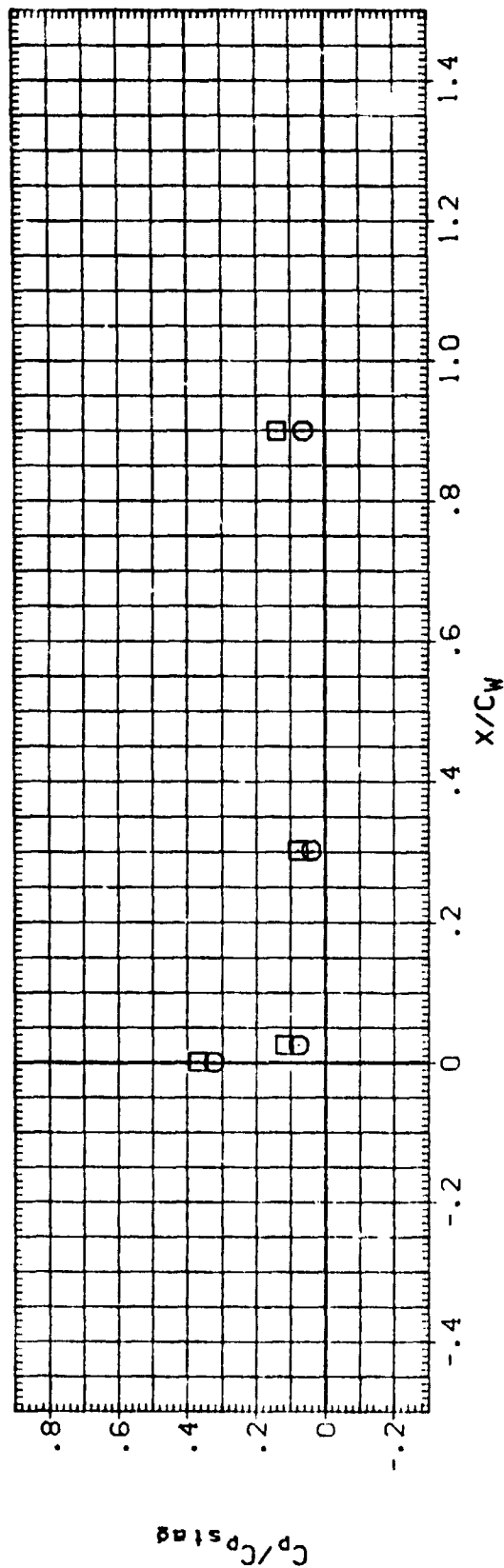


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(R03LAI) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	2Y/8W	MACH	PARAMETRIC VALUES
-16.000	.400	3.700	3.000
-5.000	.250		BETA
.000			
5.000			

RN/L

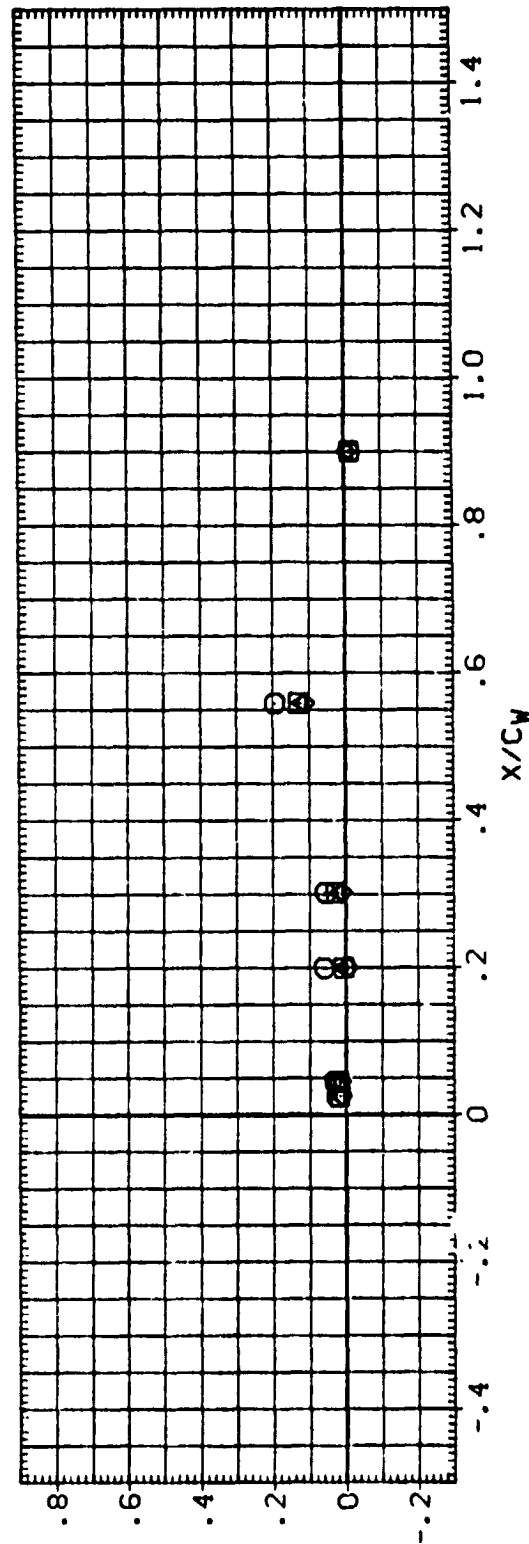
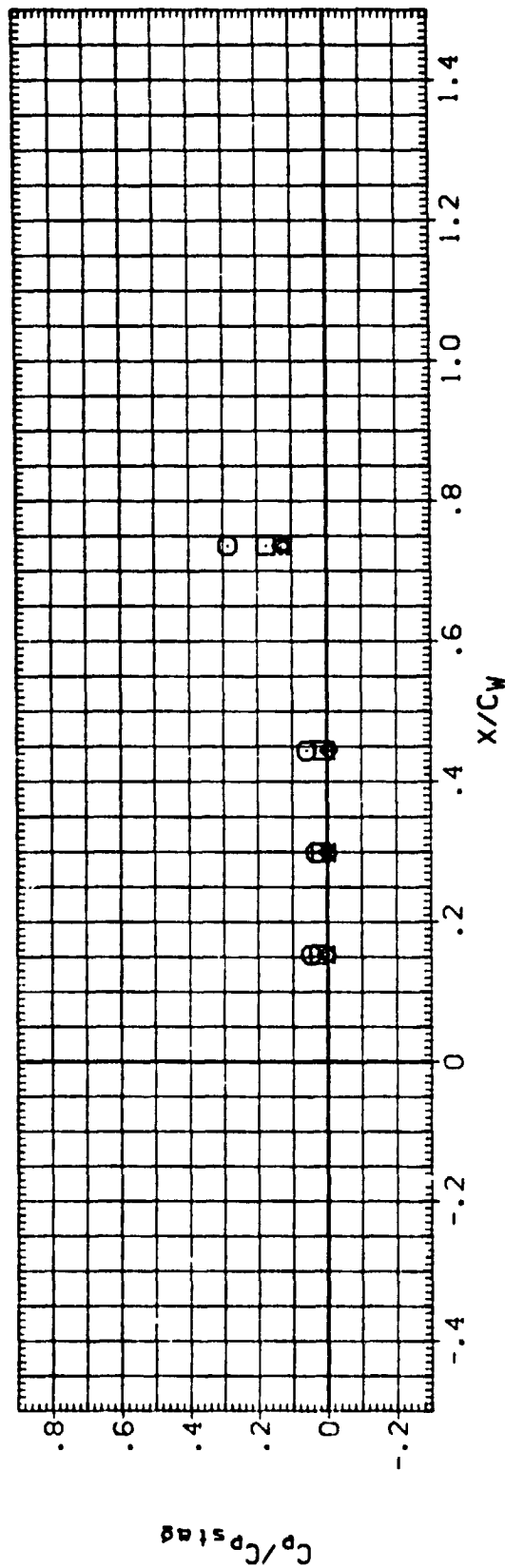


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(R03LAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA
 -10.000
 -5.000
 .000
 5.000

2Y/8V MACH
 .600 3.700
 .500

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

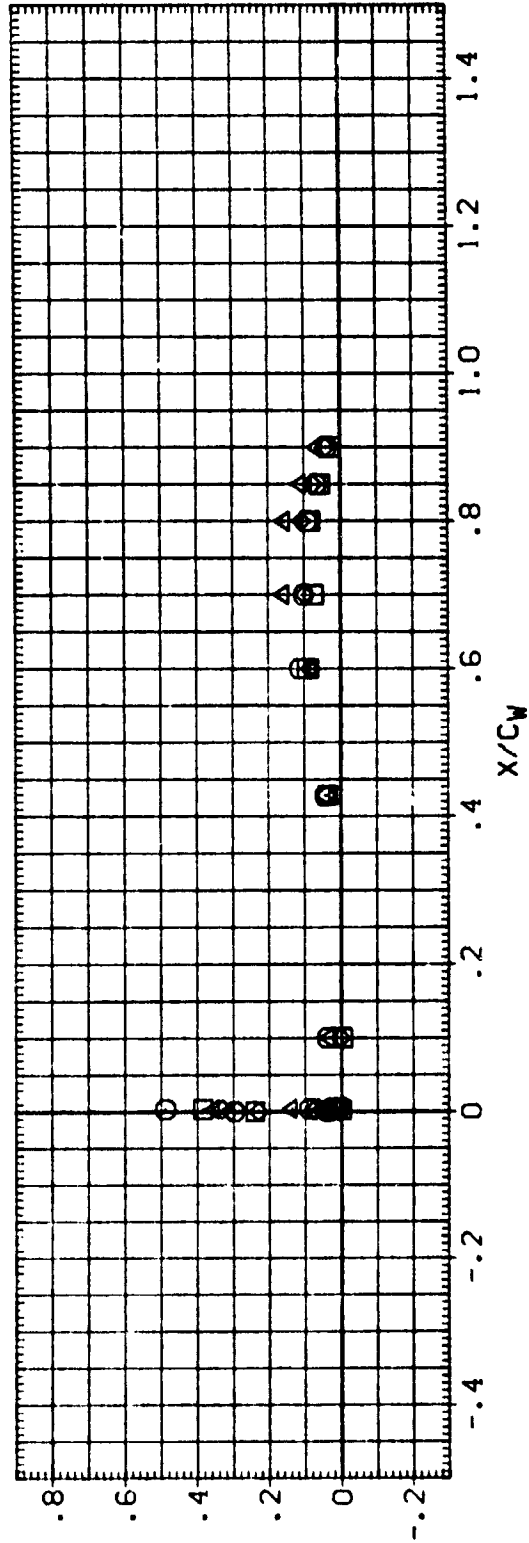
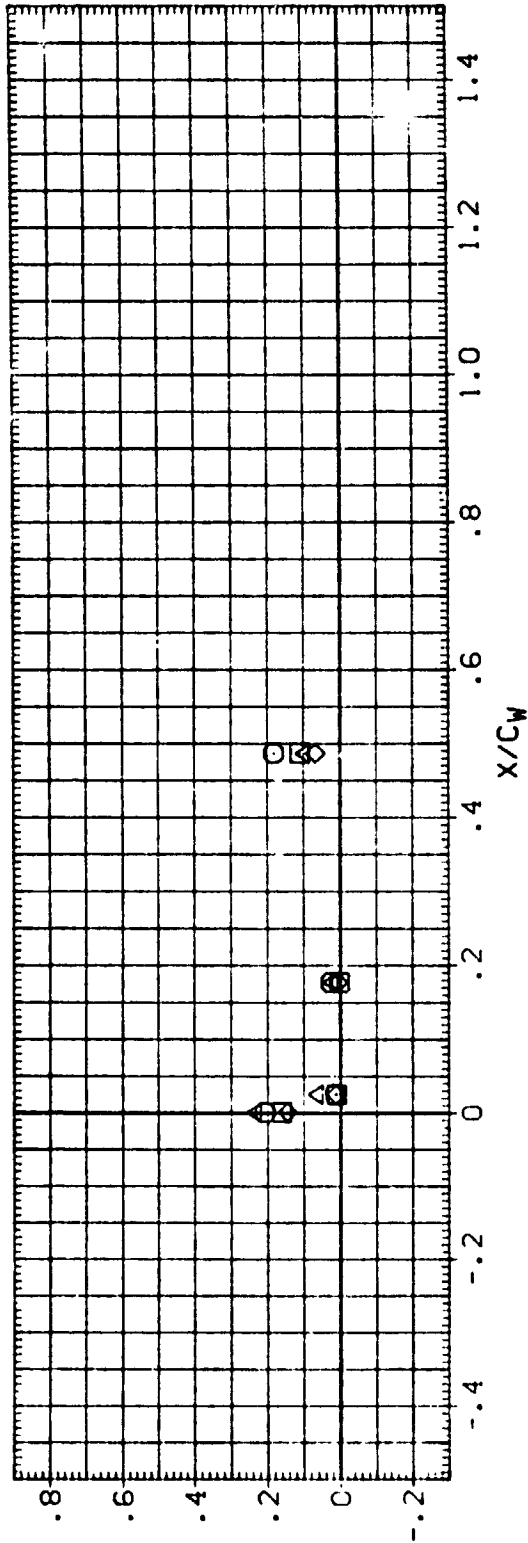


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(RQ3LAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA		2Y/BV		MACH		RN/L	PARAMETRIC VALUES	
	-10.000	.850	.3.700				3.000	BETA	.000
	-5.000	.750							
	.000								
	5.000								

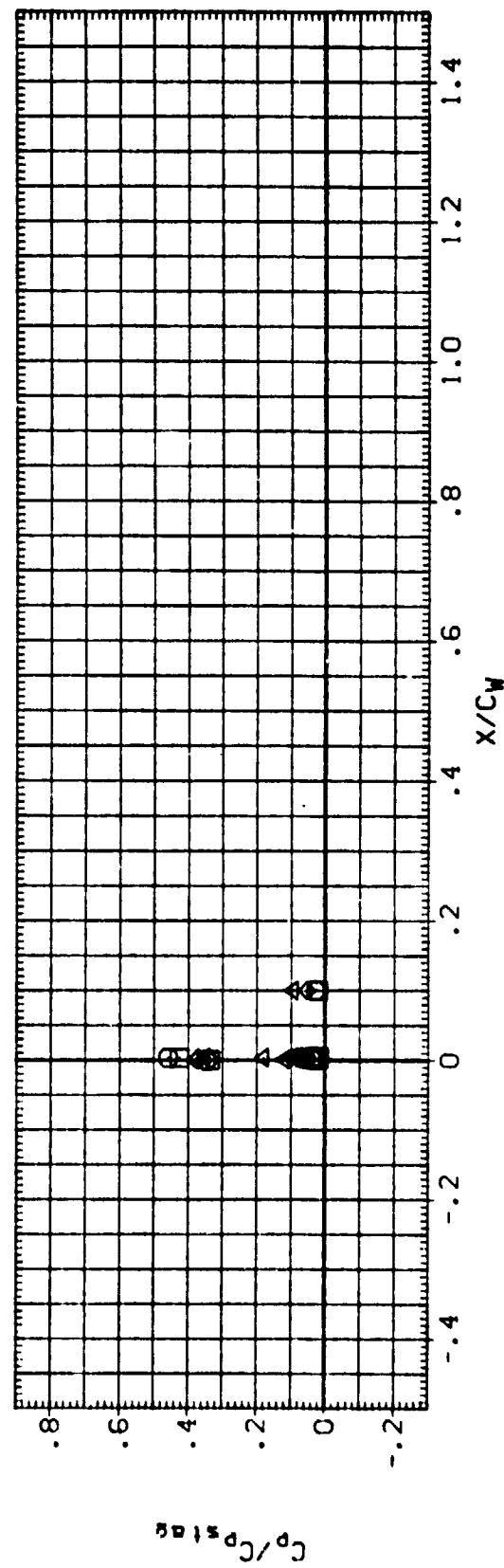
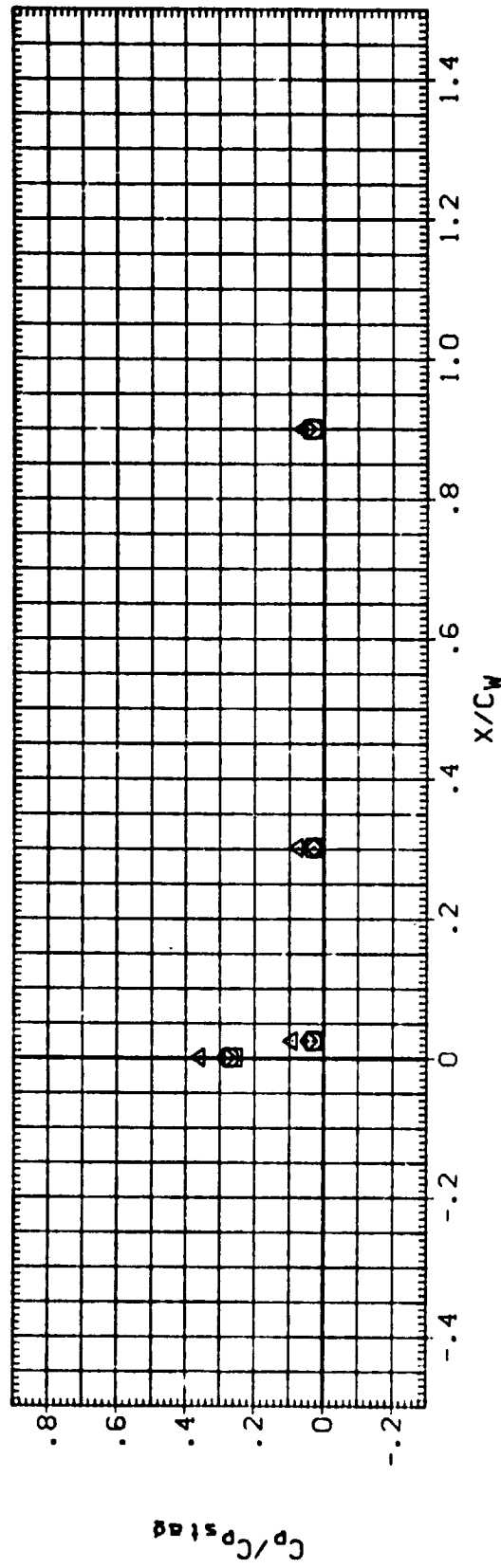


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(R03LAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA
-10.000
-5.000
.000
5.000

2Y/BV MACH
.400 4.600
.250

PARAMETRIC VALUES
RN/L 3.000 BETA .000

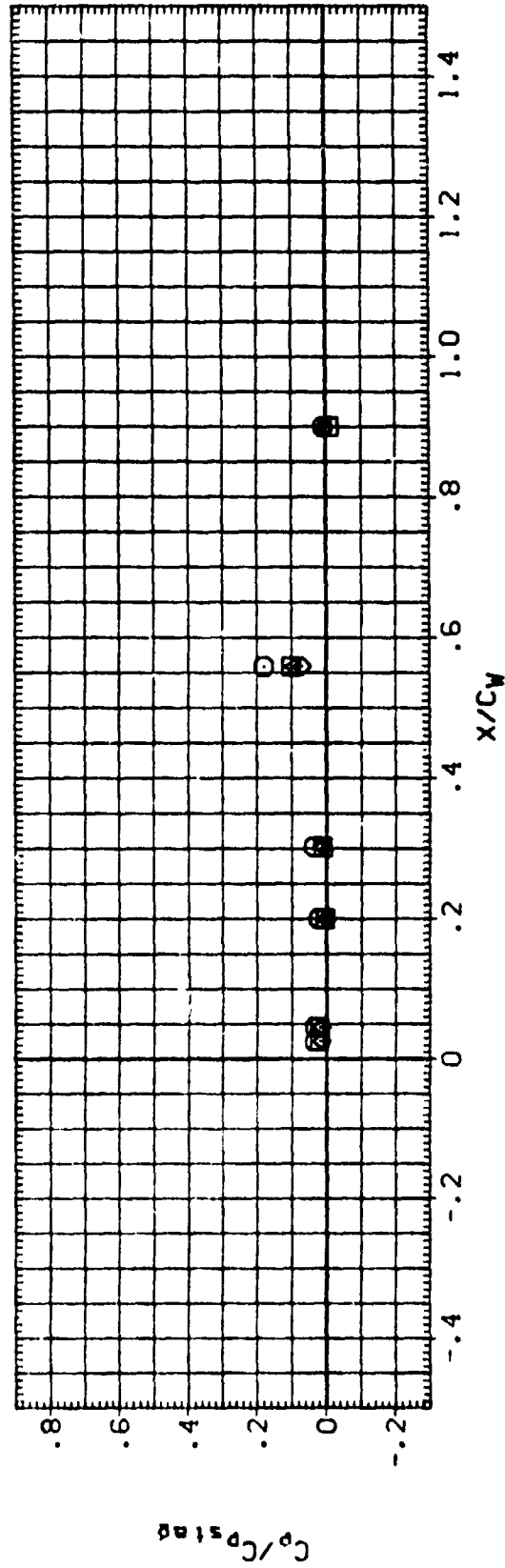
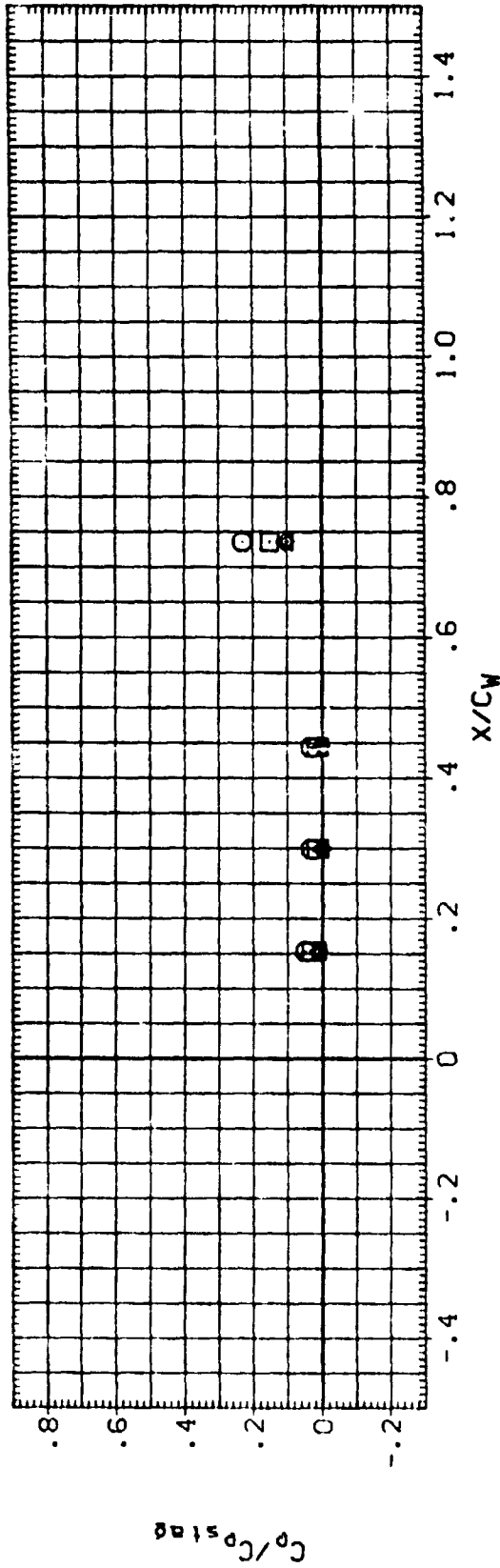


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(R03LAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2Y/BW	MACH	RN/L	PARAMETRIC VALUES	BETA
○	-10.000	.600	4.600		3.000	.000
●	-5.000	.500				
△	5.000					

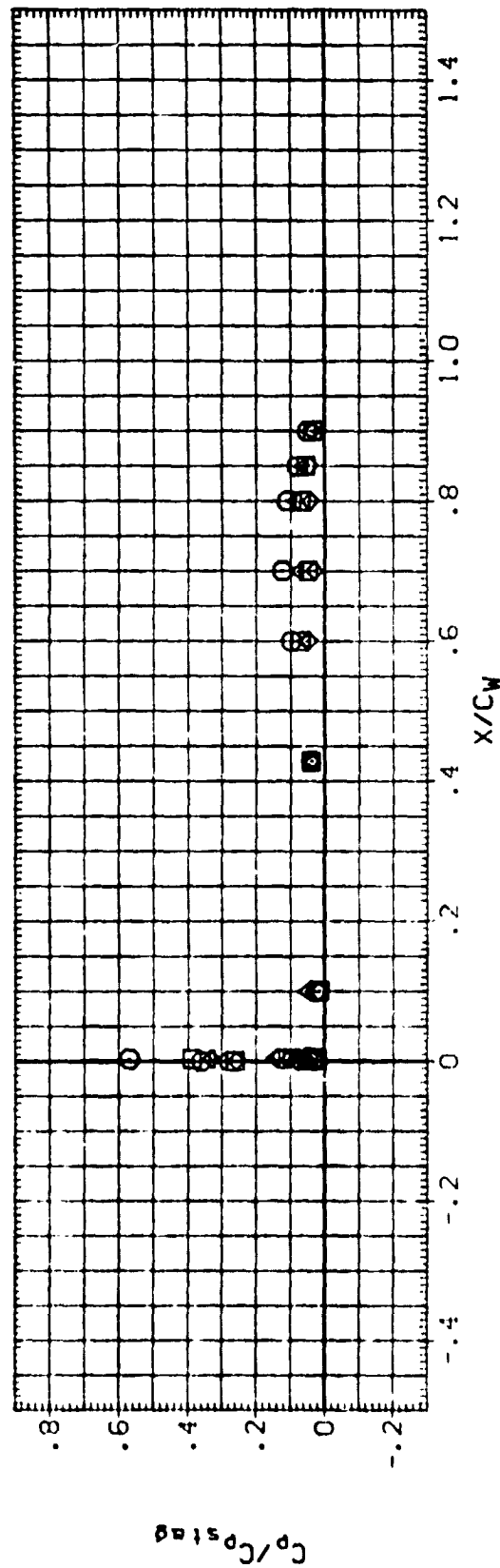
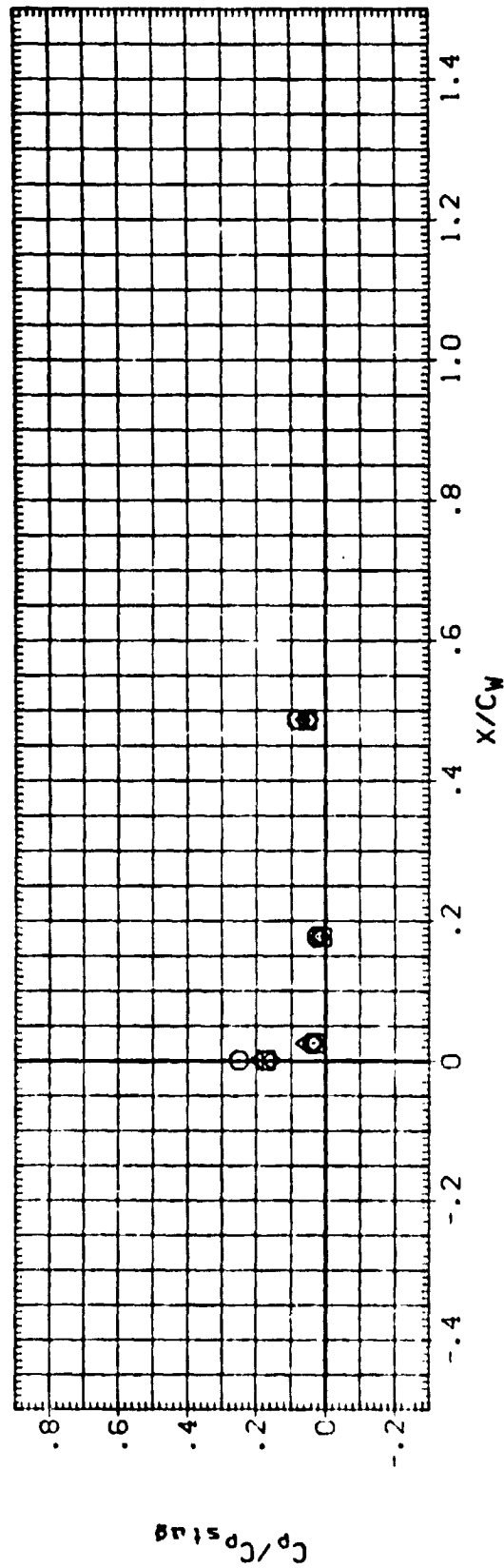


FIG. 17 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(R03LAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/BV MACH
 -10.000 .850 4.600
 -5.000 .750
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA .000

RN/L

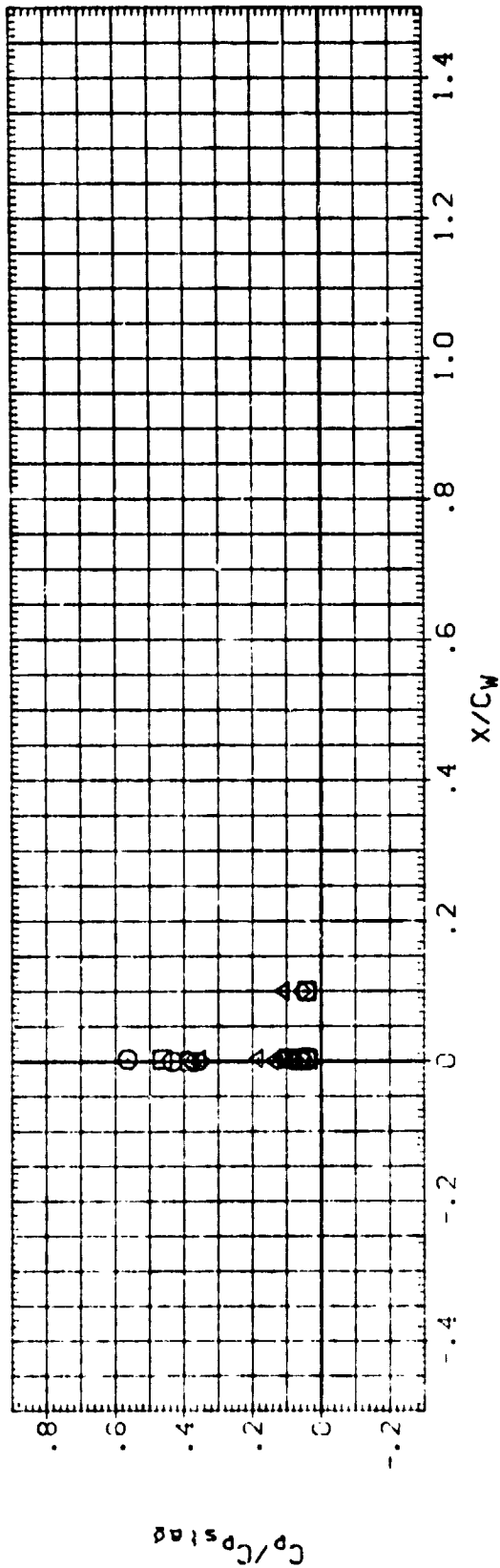
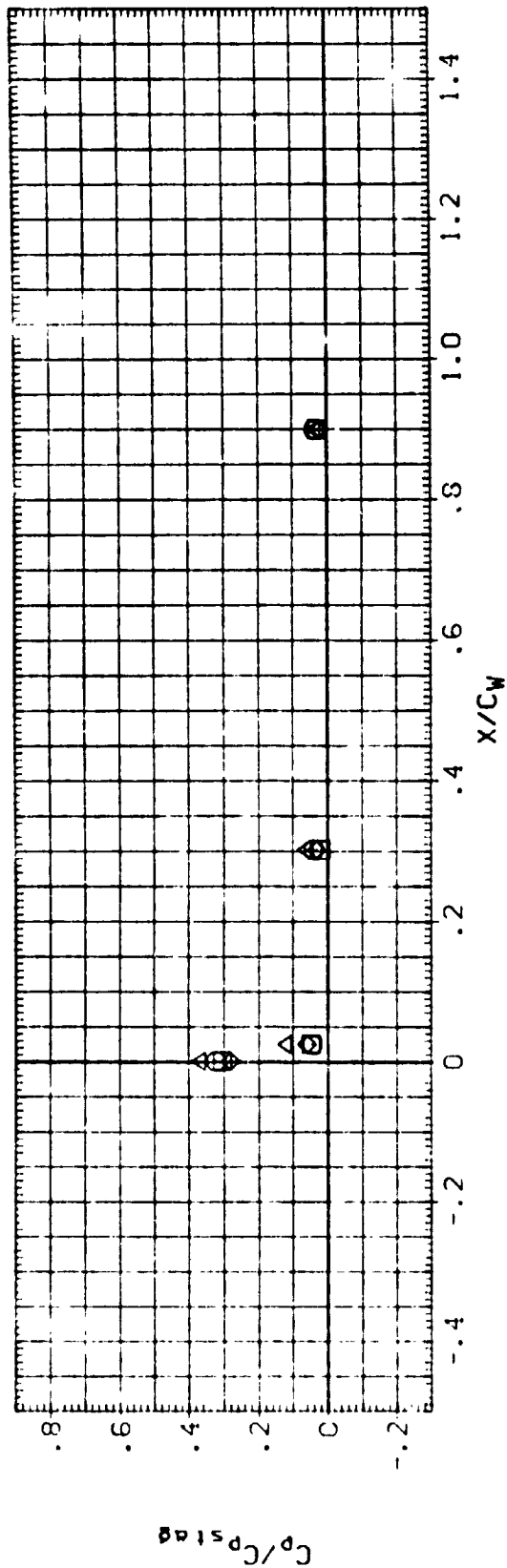


FIG. 17 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(R03UAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL ALPHA 2Y/8V MACH
 0.002 0.800 2.360
 5.000 .600
 .400

PARAMETRIC VALUES
 3.000 BETA .000
 RN/L

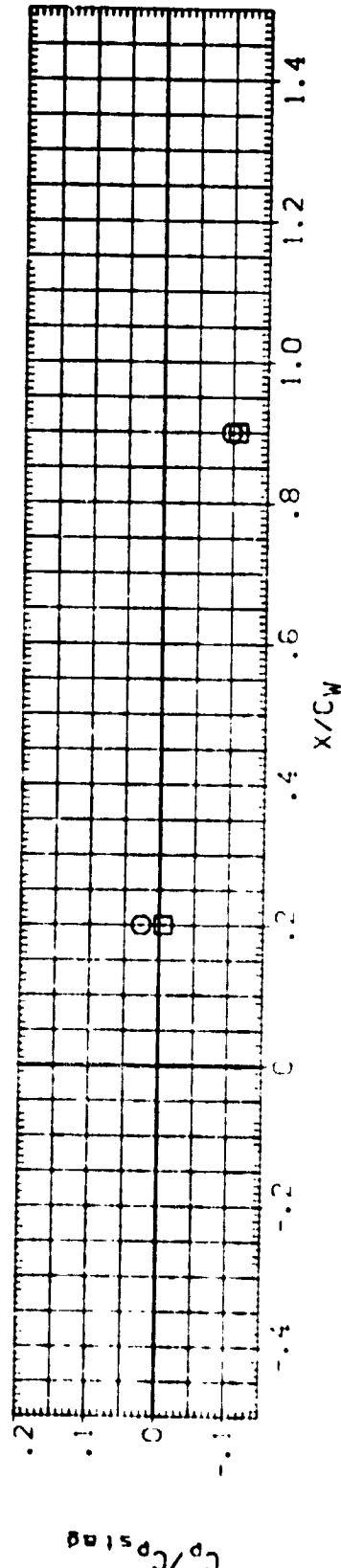
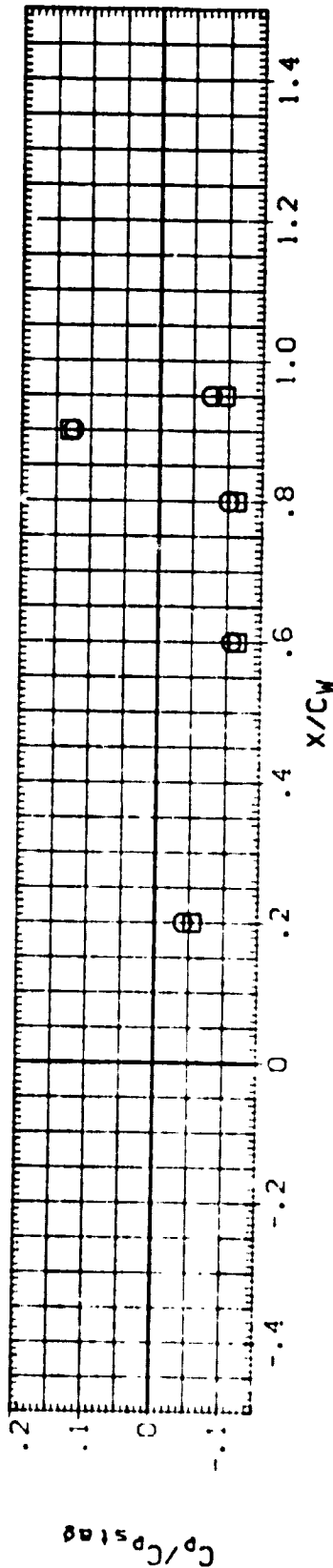
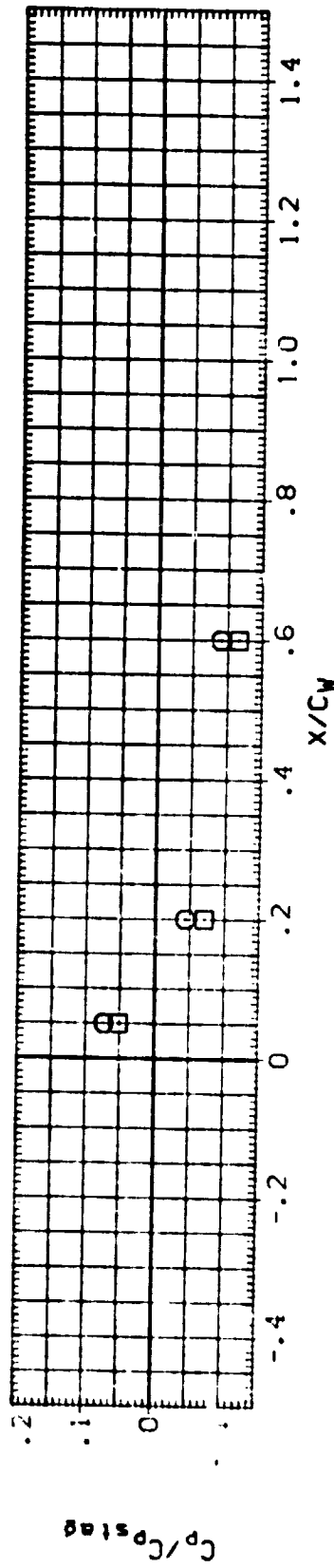


FIG. 18 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING. BETA= 0. RN/L= 3.0

(R03UAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING
 ALPHA 27/BW MACH 3.000 BETA .000
 .000 .800 .950
 .000 .600 .400

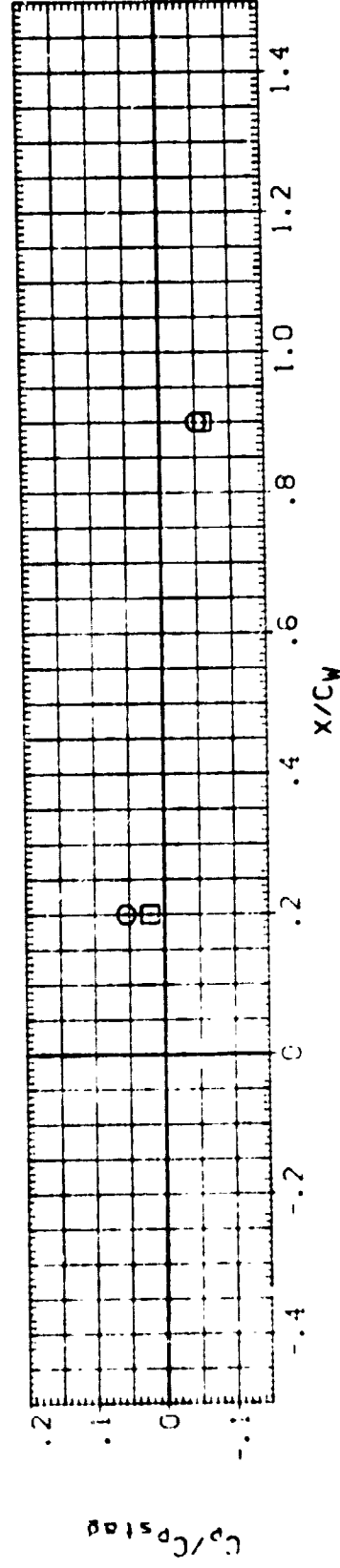
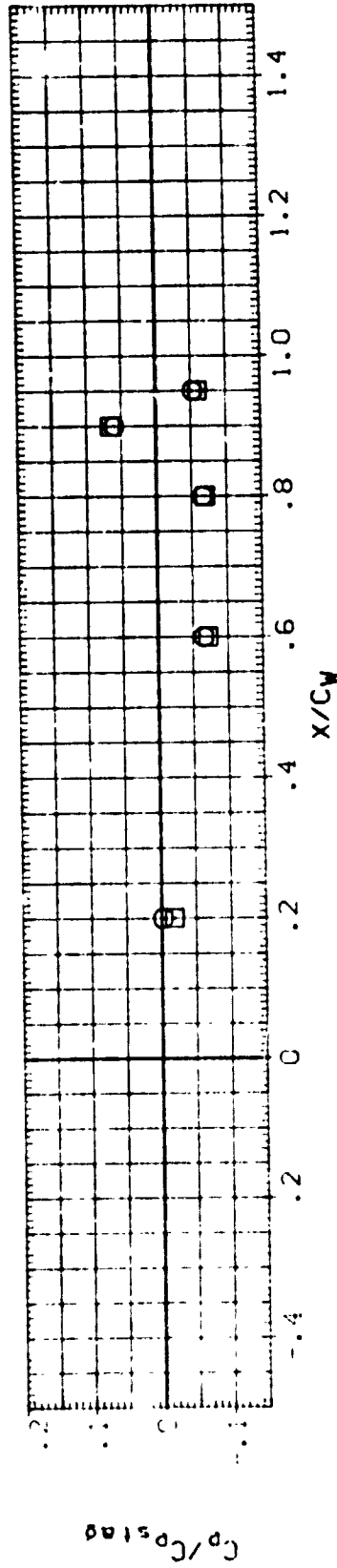
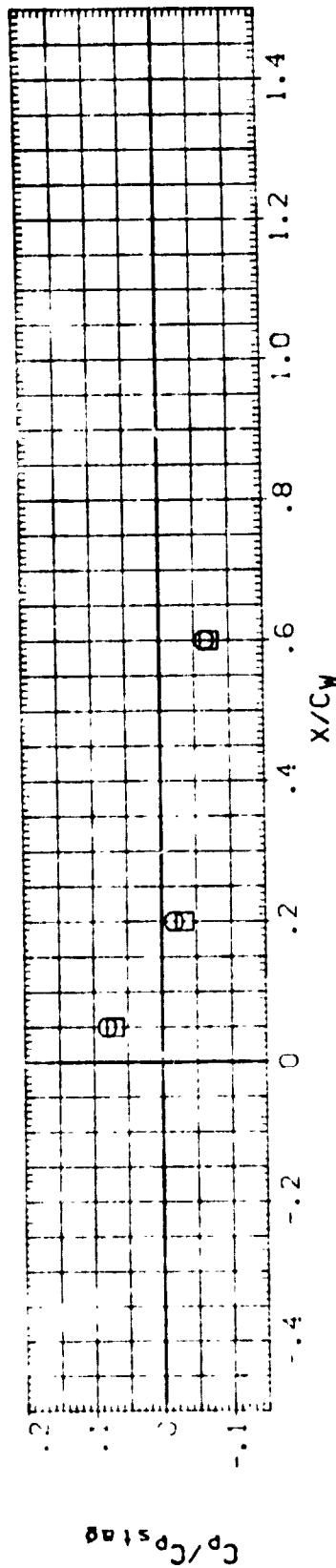


FIG. 18 VARIATION OF C_p/C_{ps1a0} ON THE INTEGRATED VEHICLE WITH T15. ORBITER
 UPPER WING. BETA= 0. RN/L= 3.0

(R033UAB) UFWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL ALPHA 21/87 MACH
 -10.000 .800 3.700
 -5.000 .600
 .000 .400
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

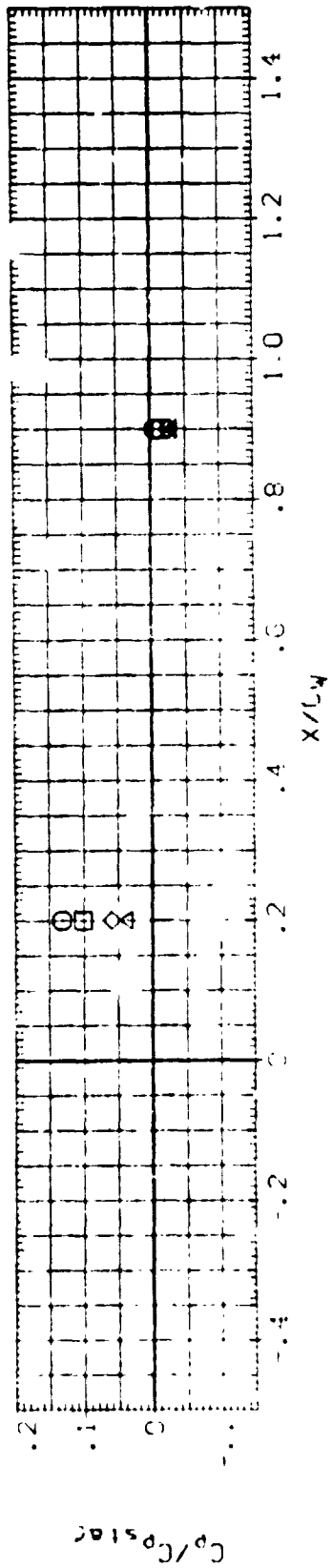
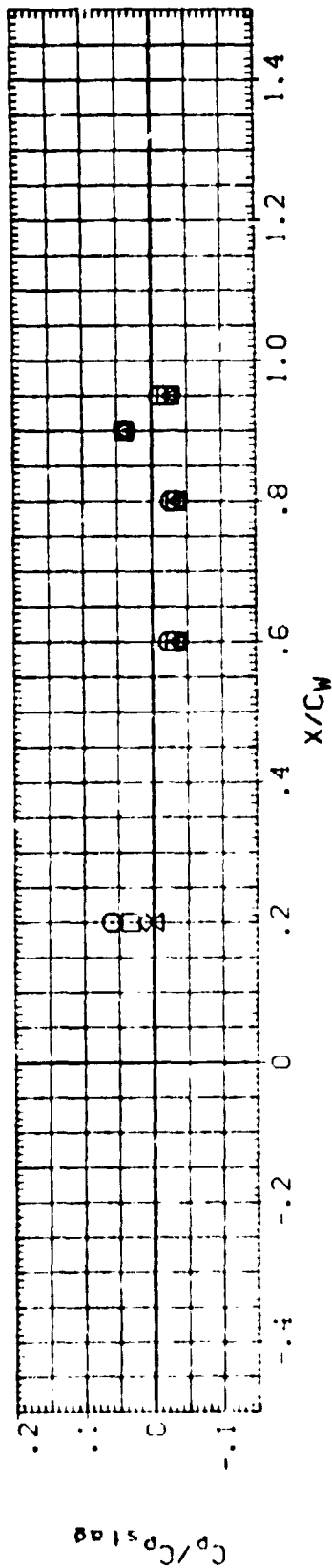
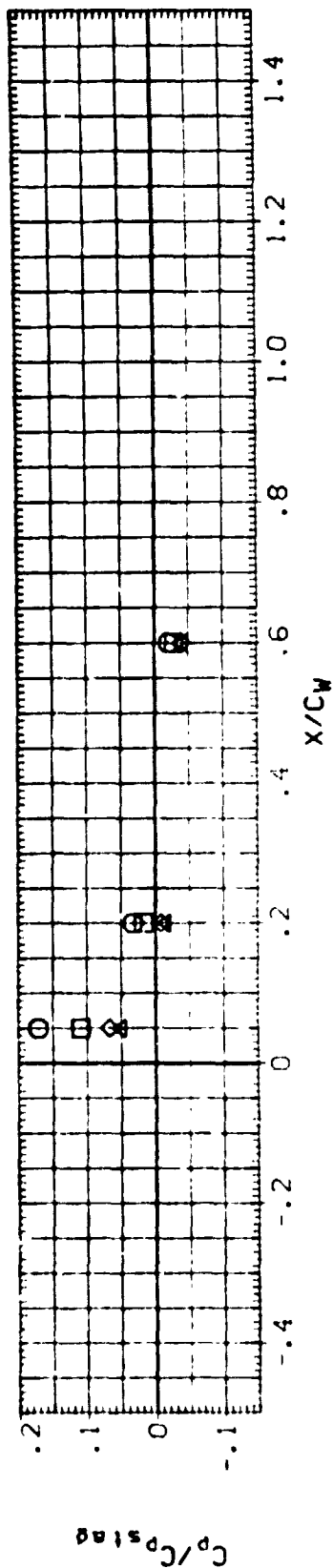


FIG. 18 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER
 UPPER WING. BETA = 0.0, RN/L = 3.0

(RQ3UAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL	ALPHA	2V/8V	MACH	RN/L	PARAMETRIC VALUES
○	-10.000	.800	4.600		3.000
□	-5.000	.600			BETA
◇	-0.000	.400			.000
×	5.000				

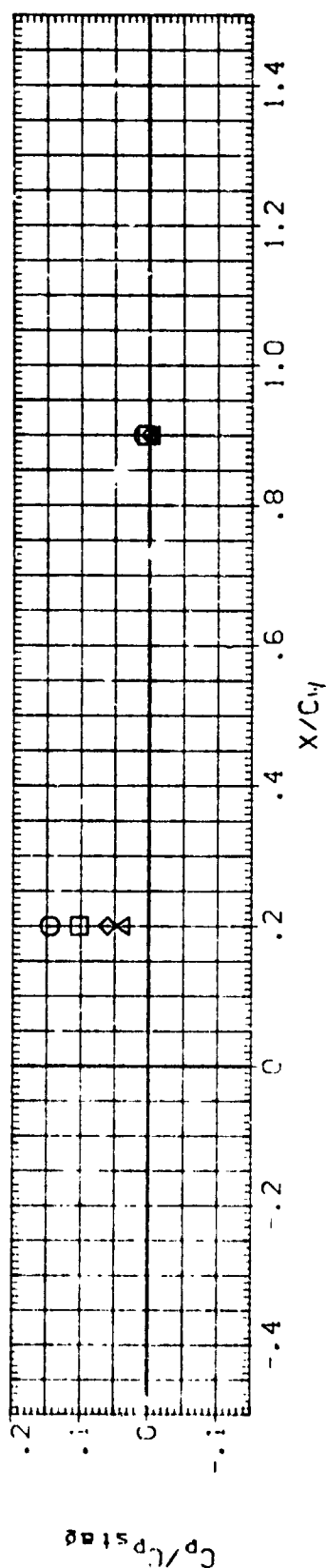
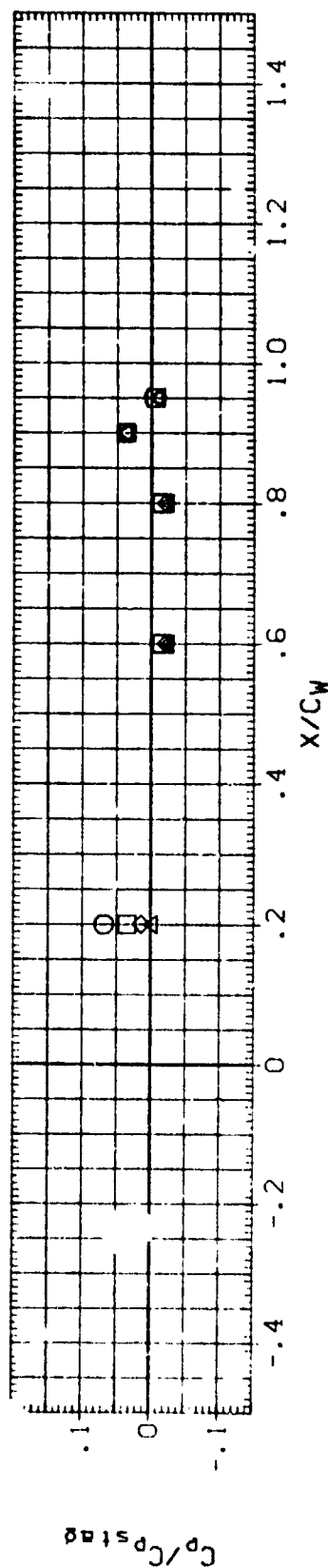
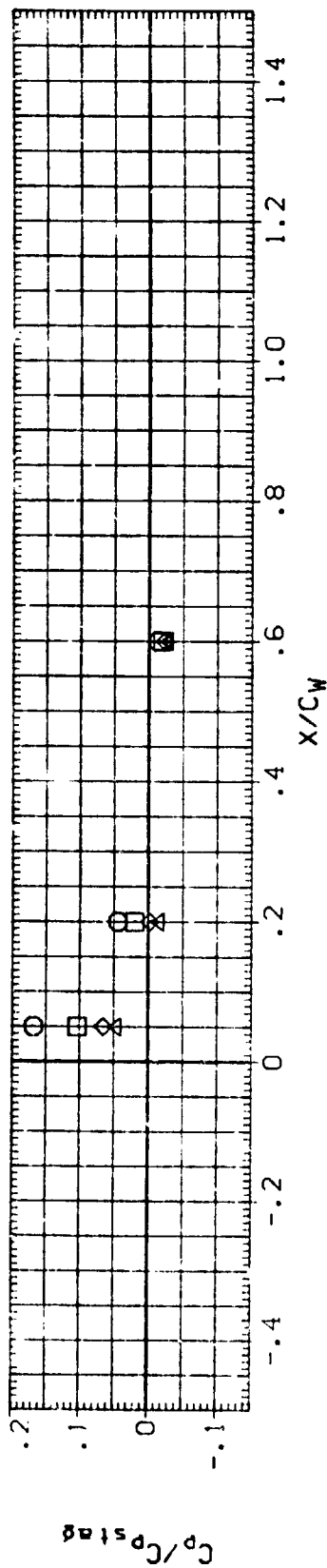


FIG. 18 VARIATION OF $C_p/C_{p_{stag}}$ ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING, $BETA = 0$, $RN/L = 3.0$

(RQ3VAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL	ALPHA	Z/BV	MACH	RN/L	PARAMETRIC VALUES
□	.000	.299	2.360		3.000 BETA .000
	5.000	.532			
		.765			

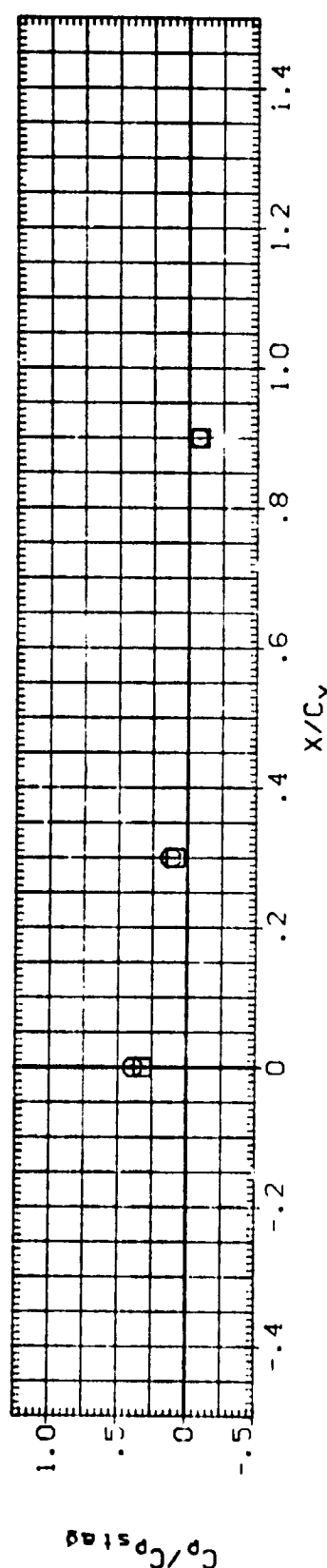
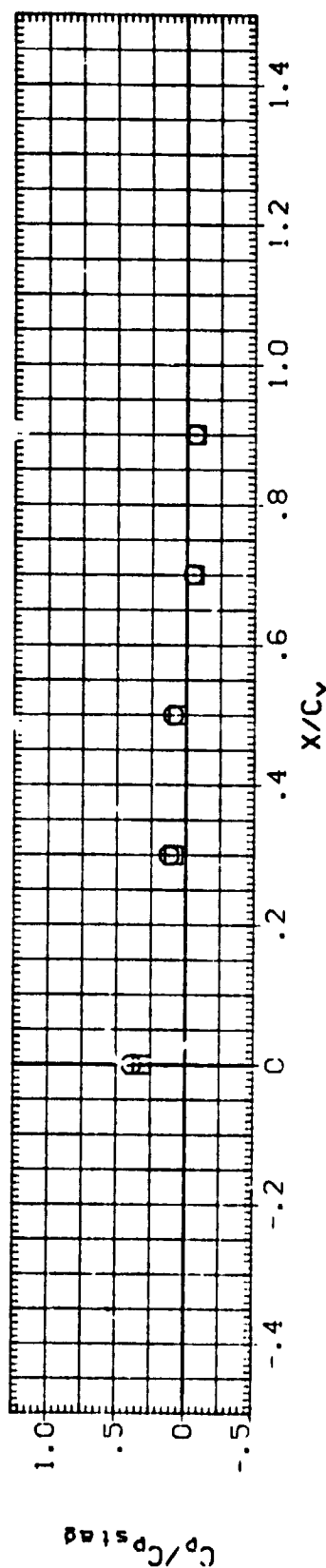
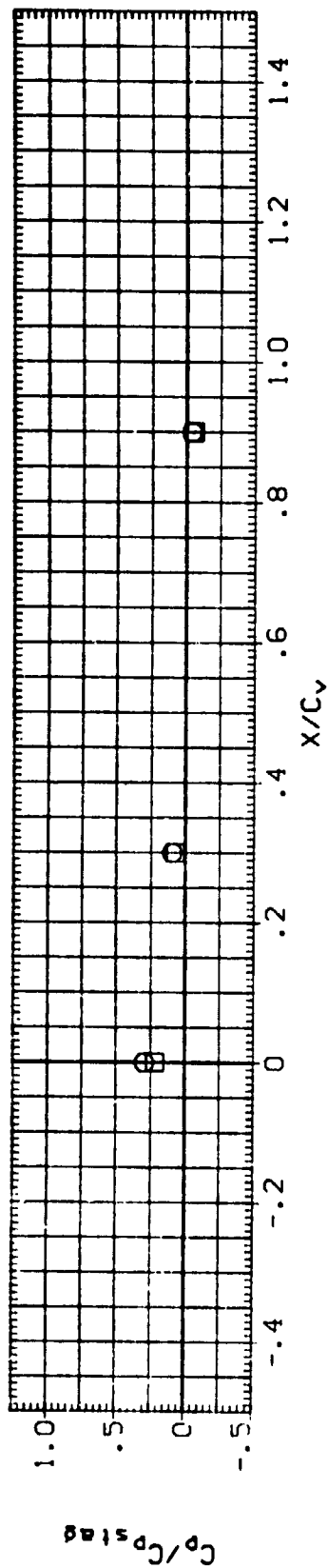


FIG. 19 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 0. RN/L= 3.0

(R03VAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

PARAMETRIC VALUES
RN/L 3.000 BETA .000

SYMBOL ALPHA Z/BV MACH
.000 .299 2.950
5.000 .532
.765

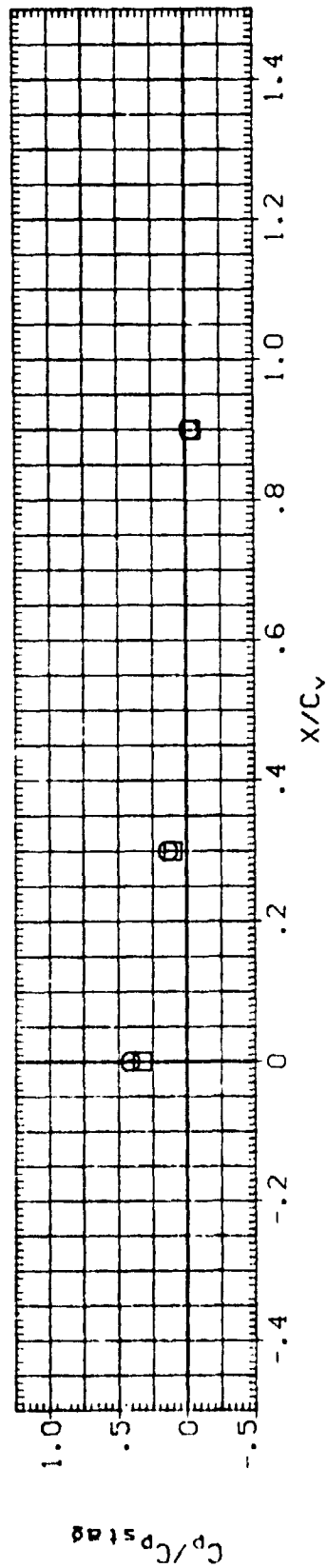
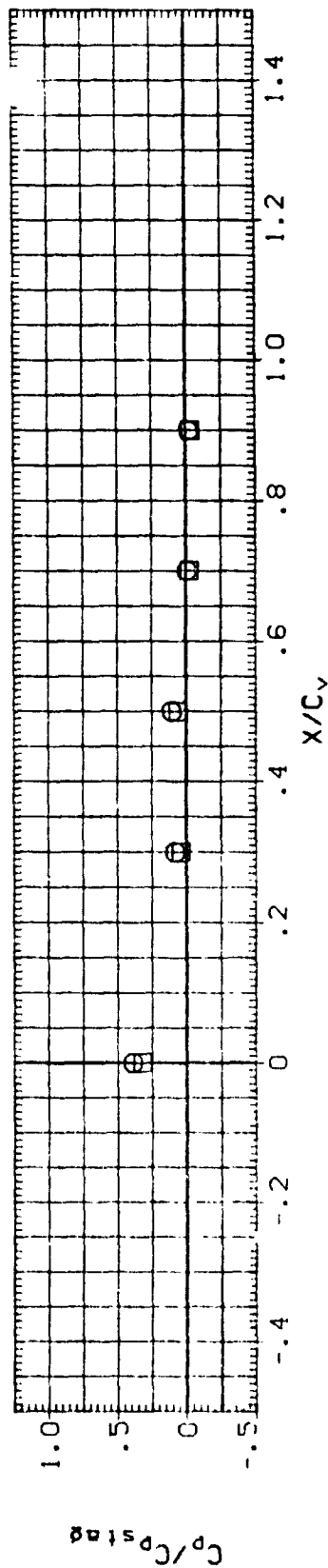
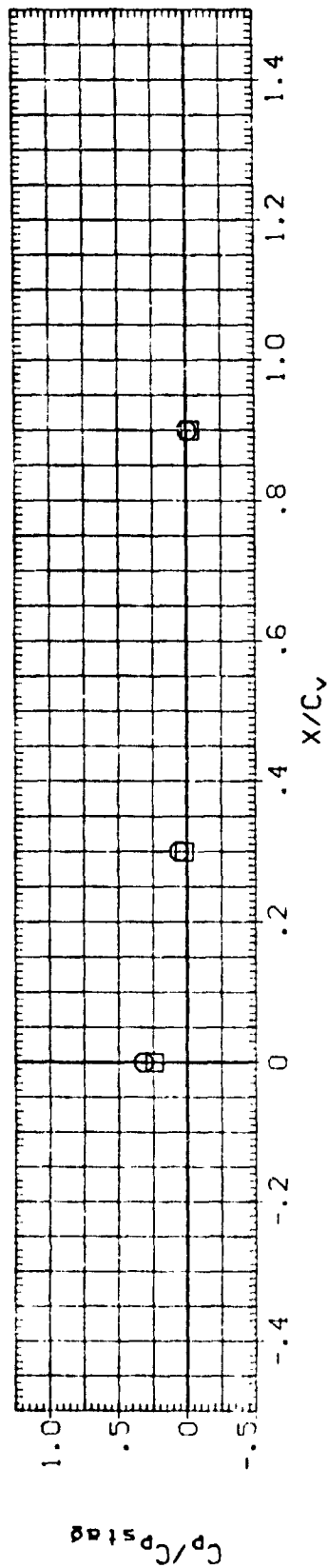


FIG. 19 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 0. RN/L= 3.0

(R03VAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL ALPHA Z/BV MACH
 -10.000 .299 3.700
 -5.000 .532
 .000 .765
 5.000

PARAMETRIC VALUES
 3.000 BETA .000
 RN/L

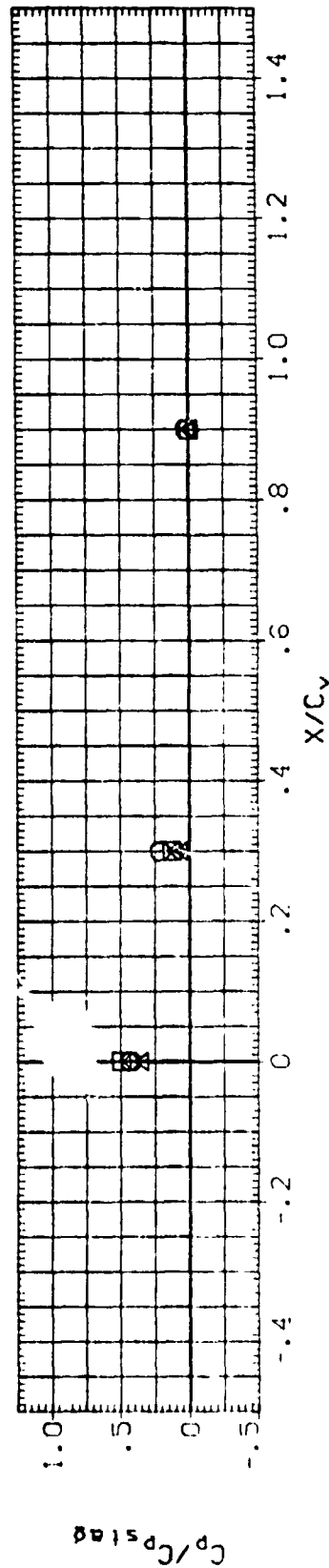
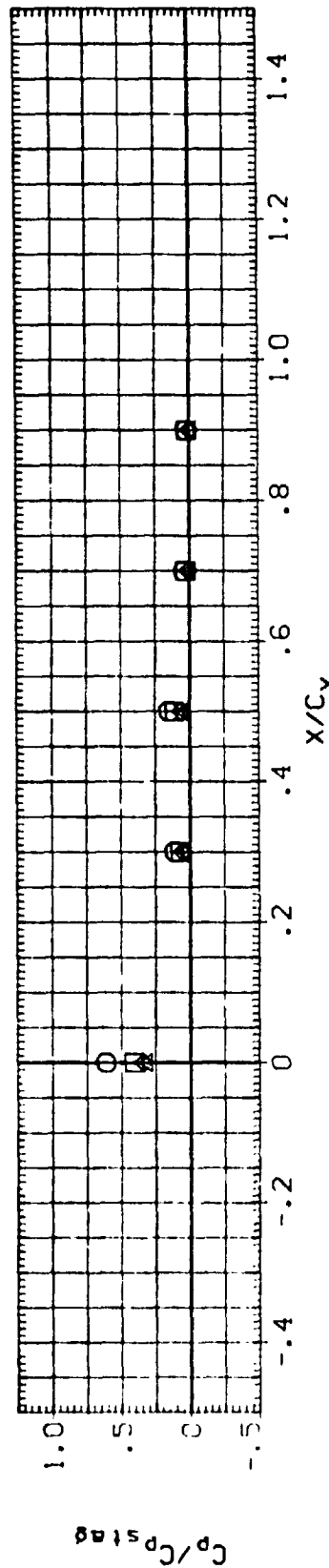
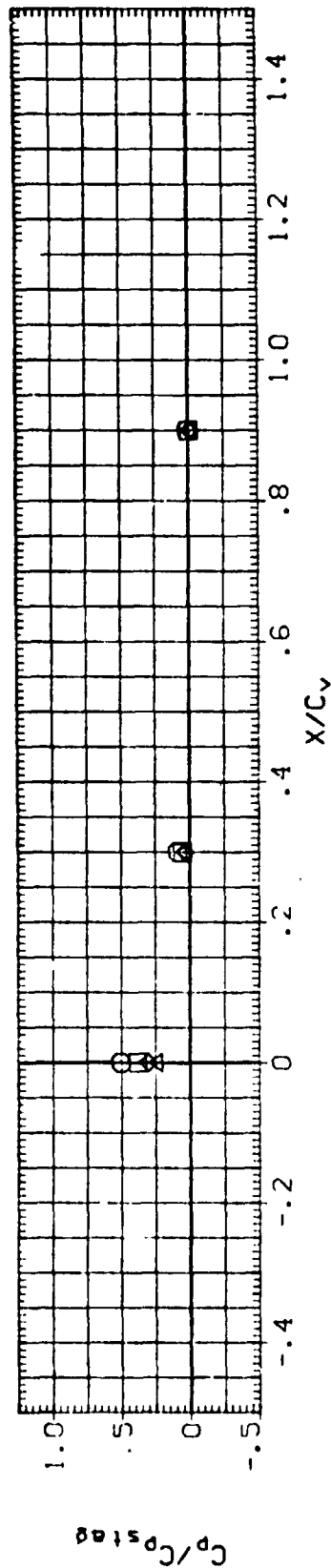


FIG. 19 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 0. RN/L= 3.0

(R03VAB) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL ALPHA Z/BV MACH
 -12.000 .299 4.600
 -5.000 .532
 .000 .765
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

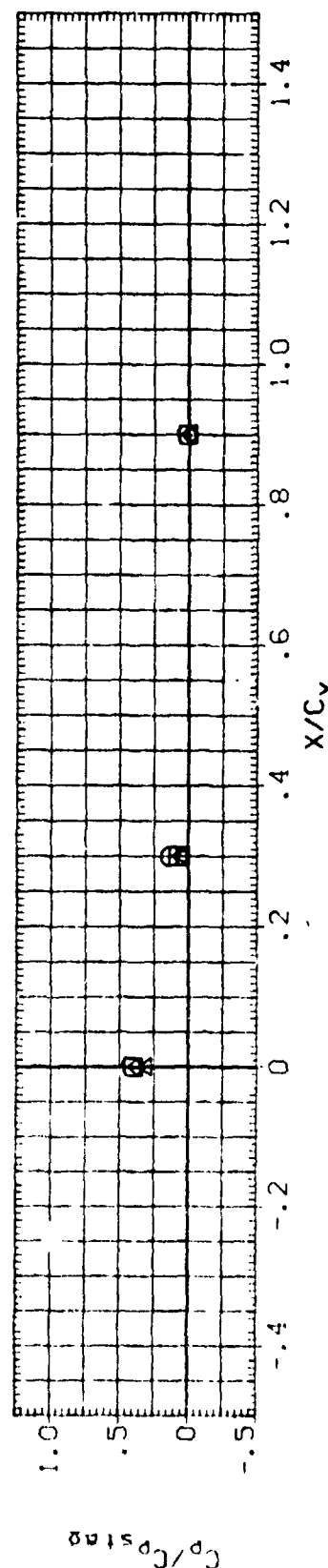
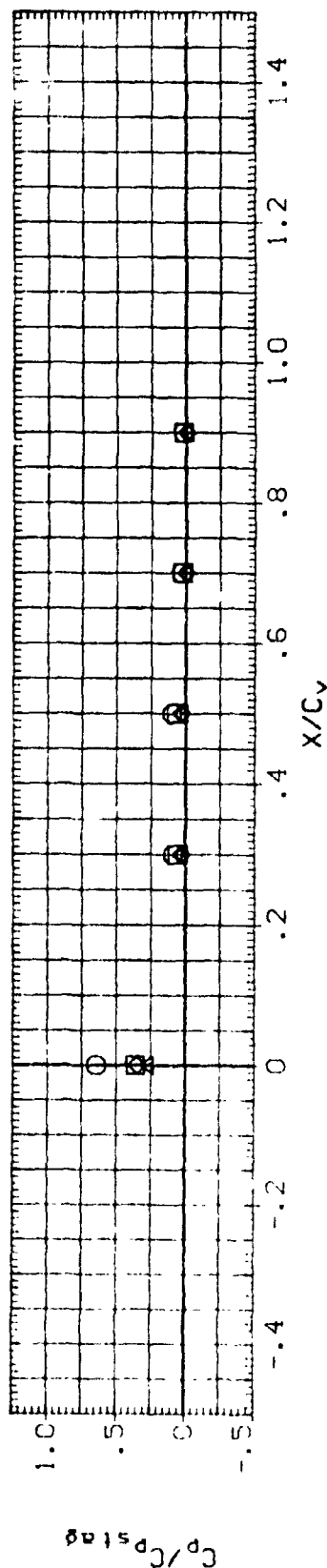
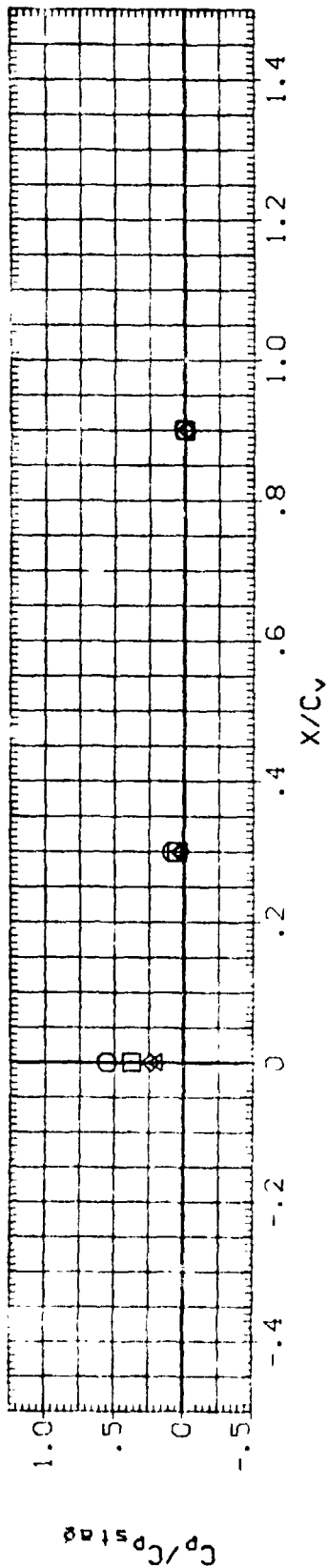


FIG. 19 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 0. RN/L= 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N)6 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 .000 67.500 2.360
 5.000 .000

PARAMETRIC VALUES
 3.000 BETA .000

RN/L

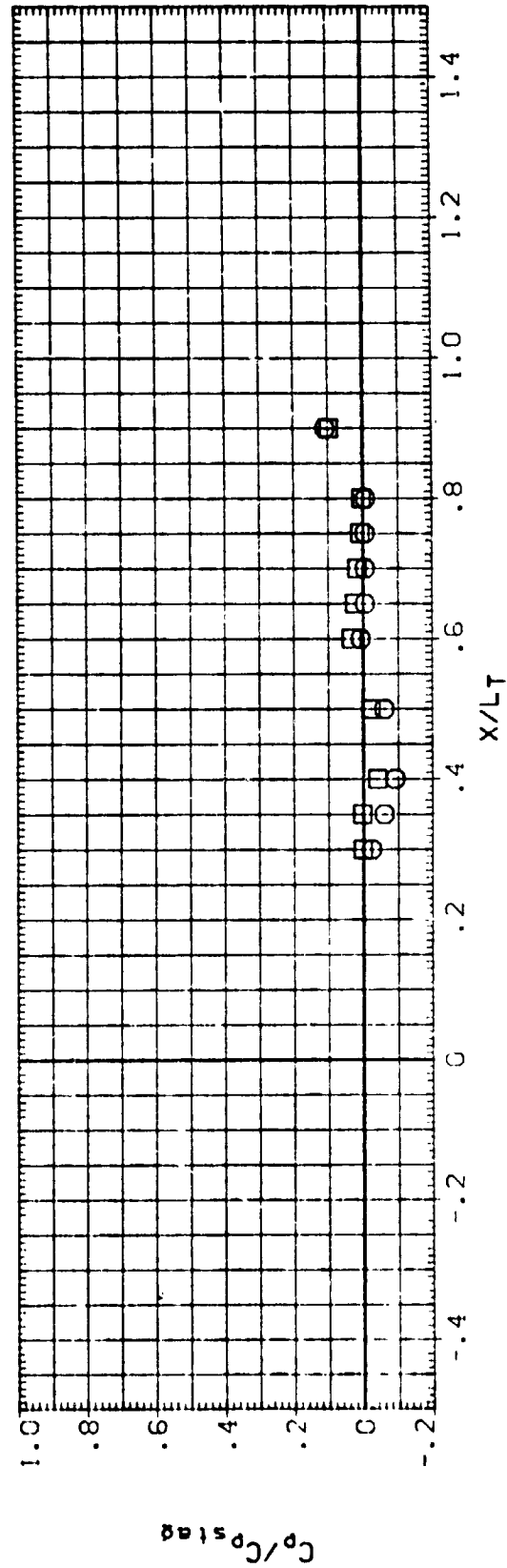
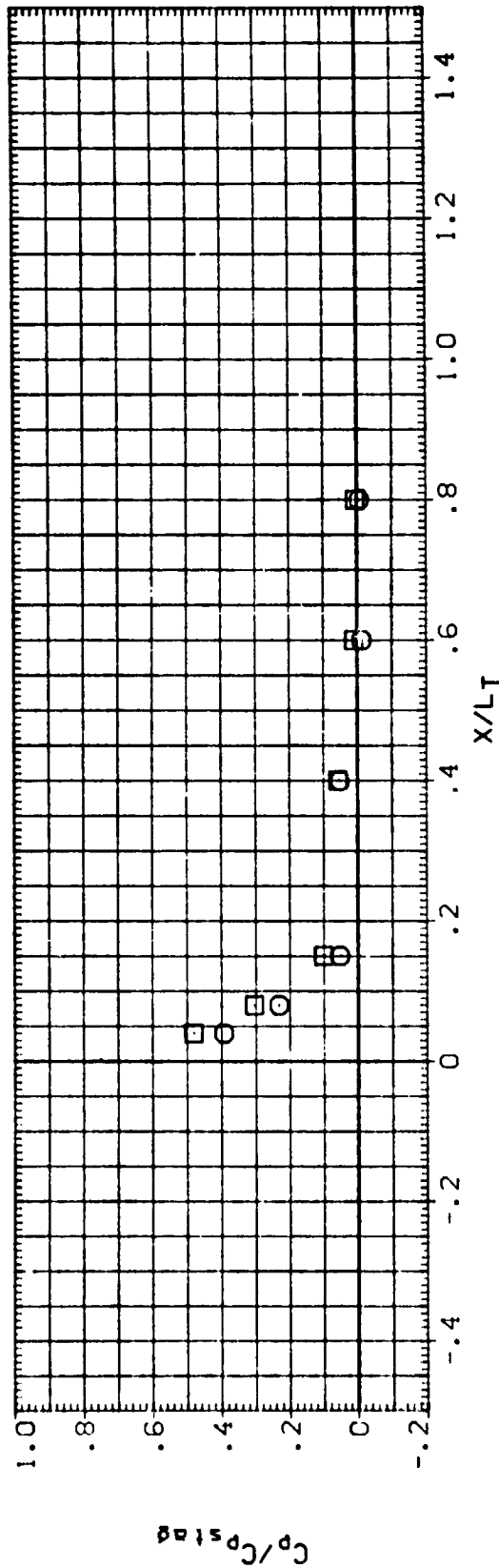


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03T/8) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 5.000 112.500 2.360

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

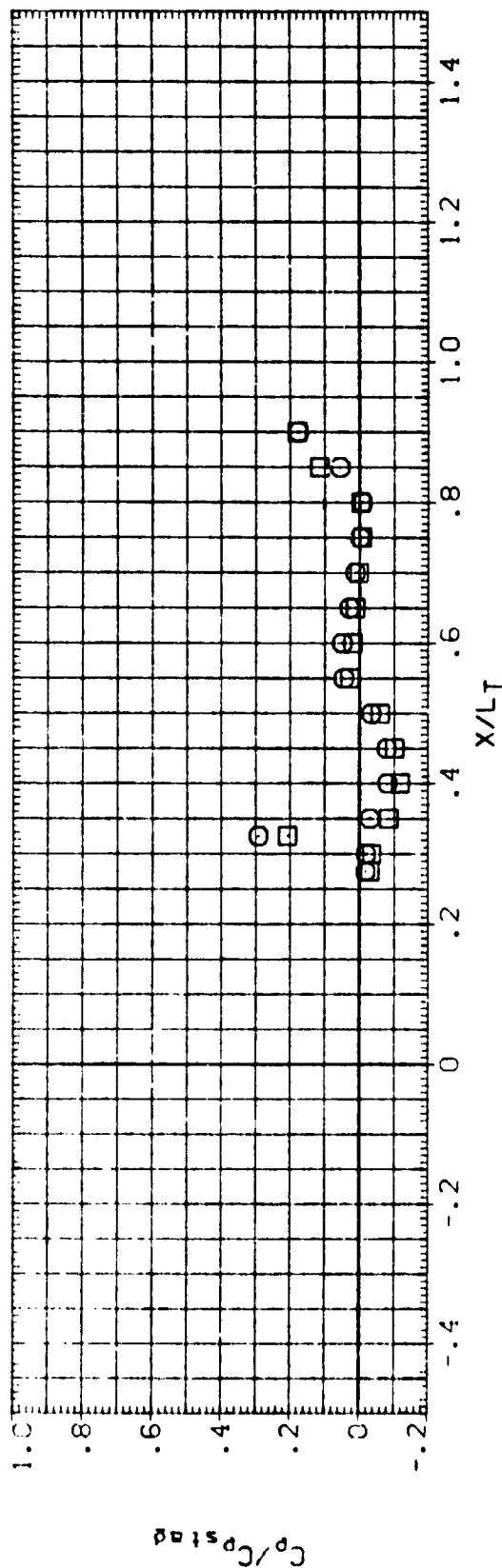
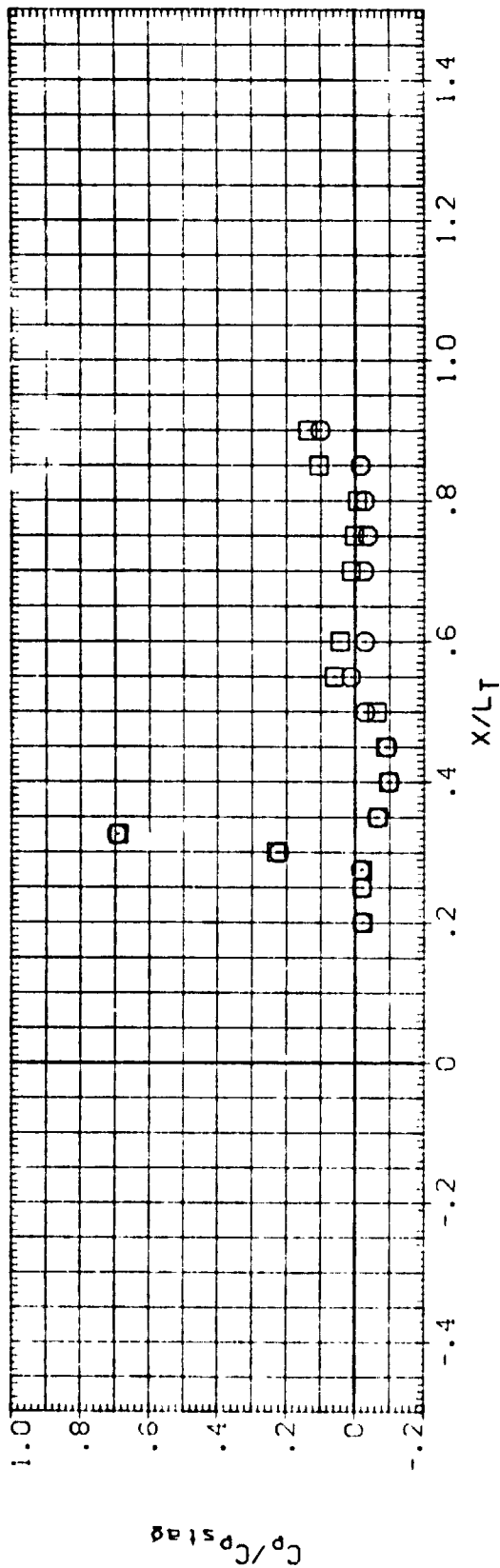


FIG. 20 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA T-META MACH
 5.000 135.000 2.360

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

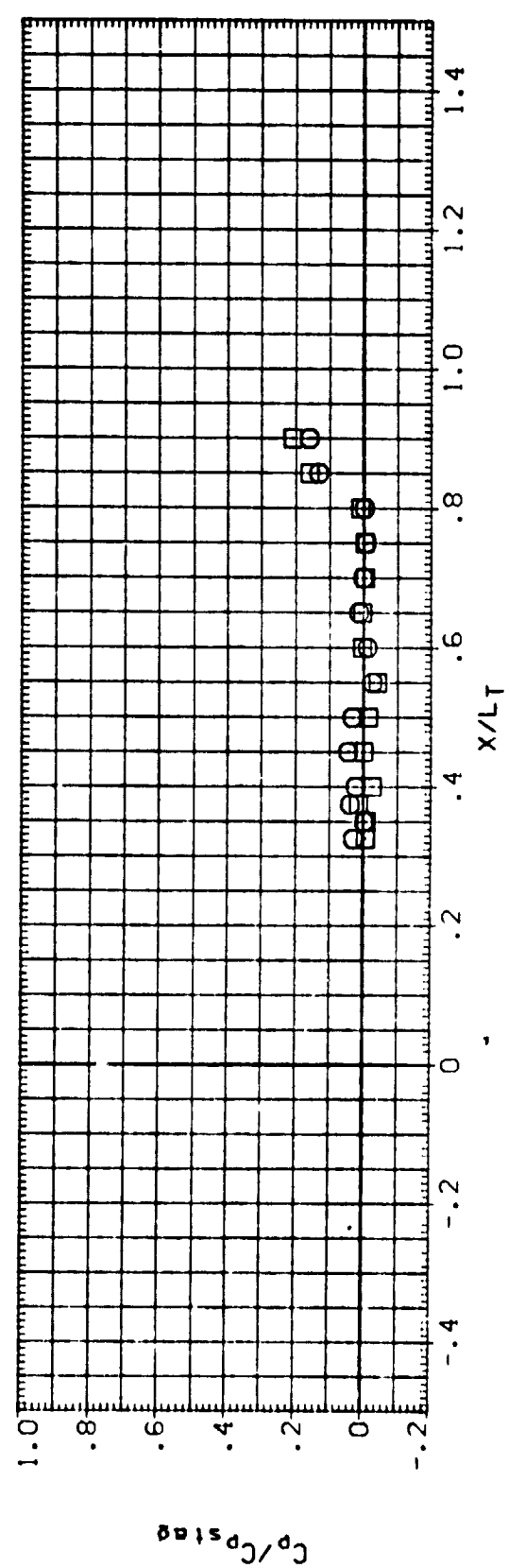
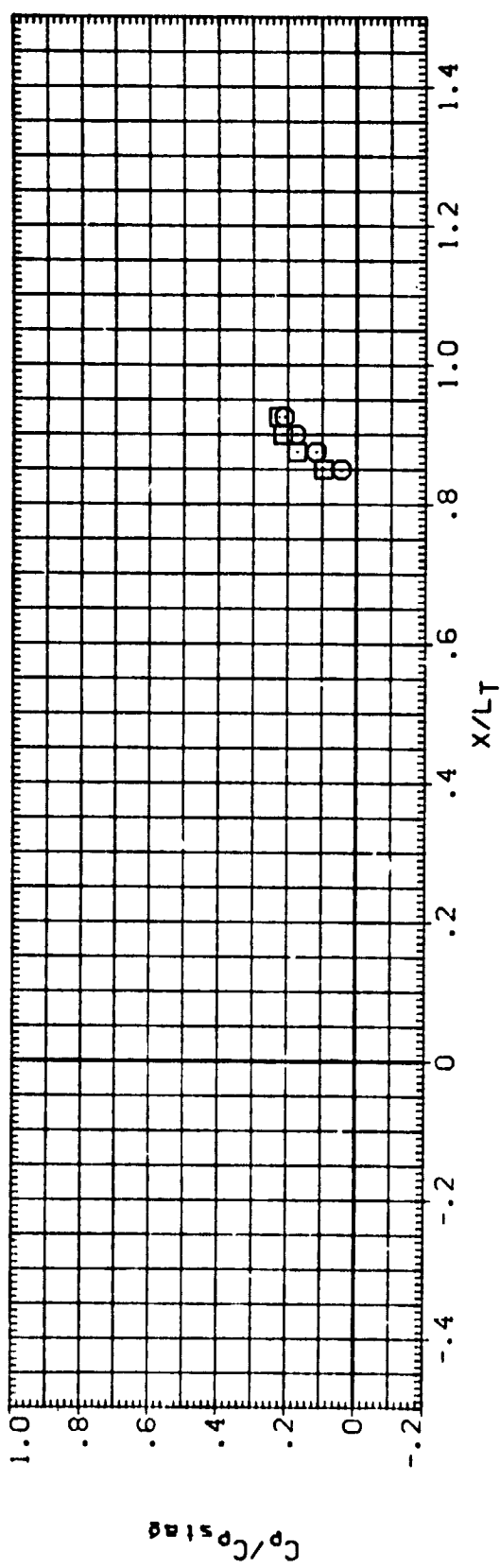


FIG. 20 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH 2.360

THETA 180.000
157.500

ALPHA .000
5.000

□

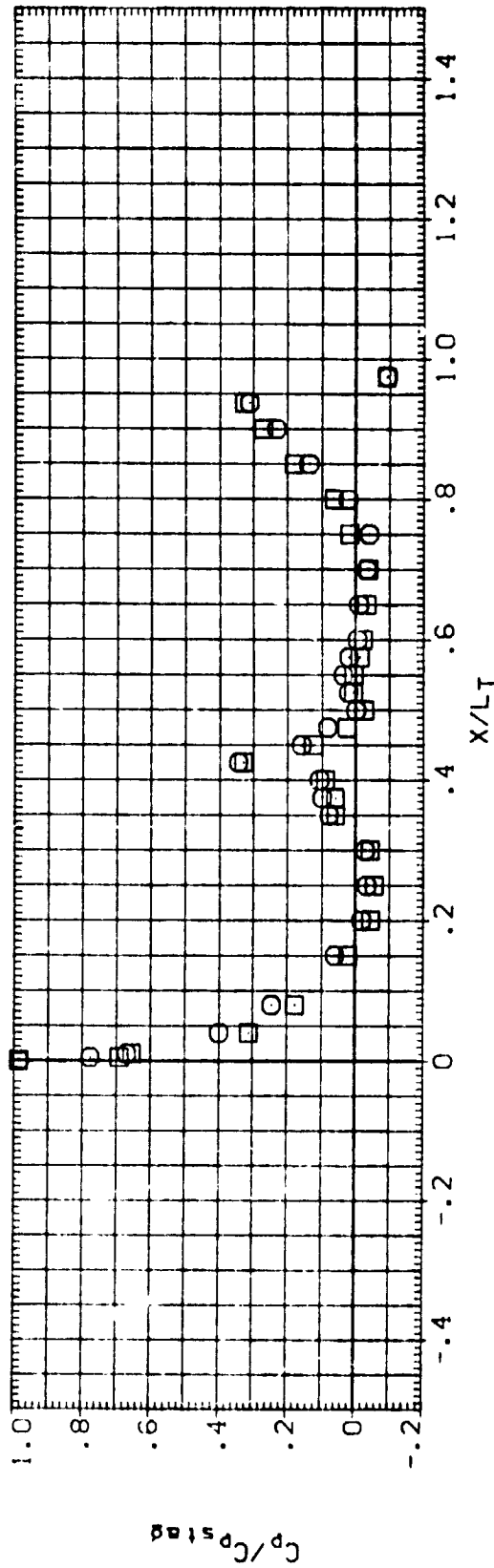
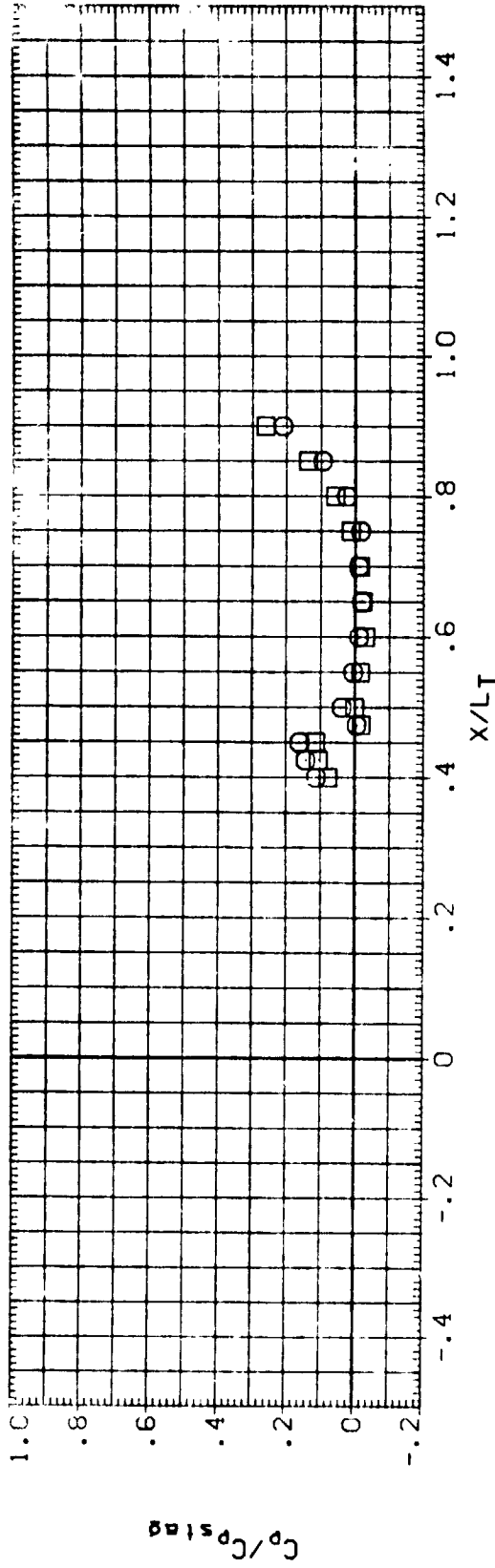


FIG. 20 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	RN/L	PARAMETRIC VALUES
□	.000	210.000	2.360	3.000	BETA
□	5.000	197.000			.000

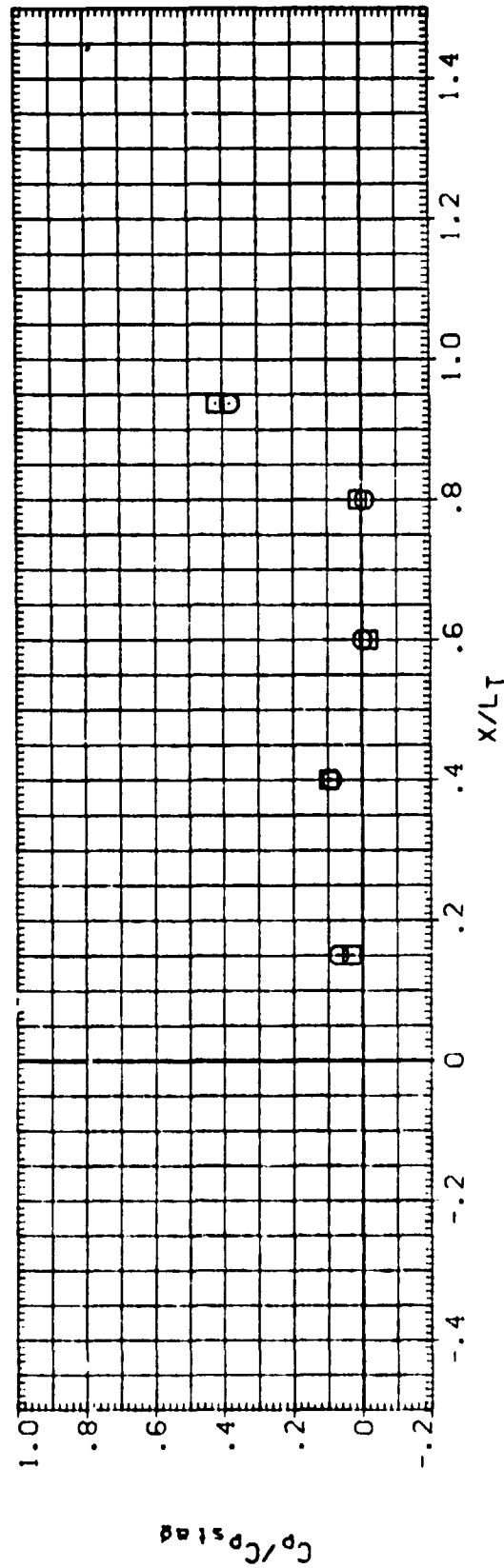
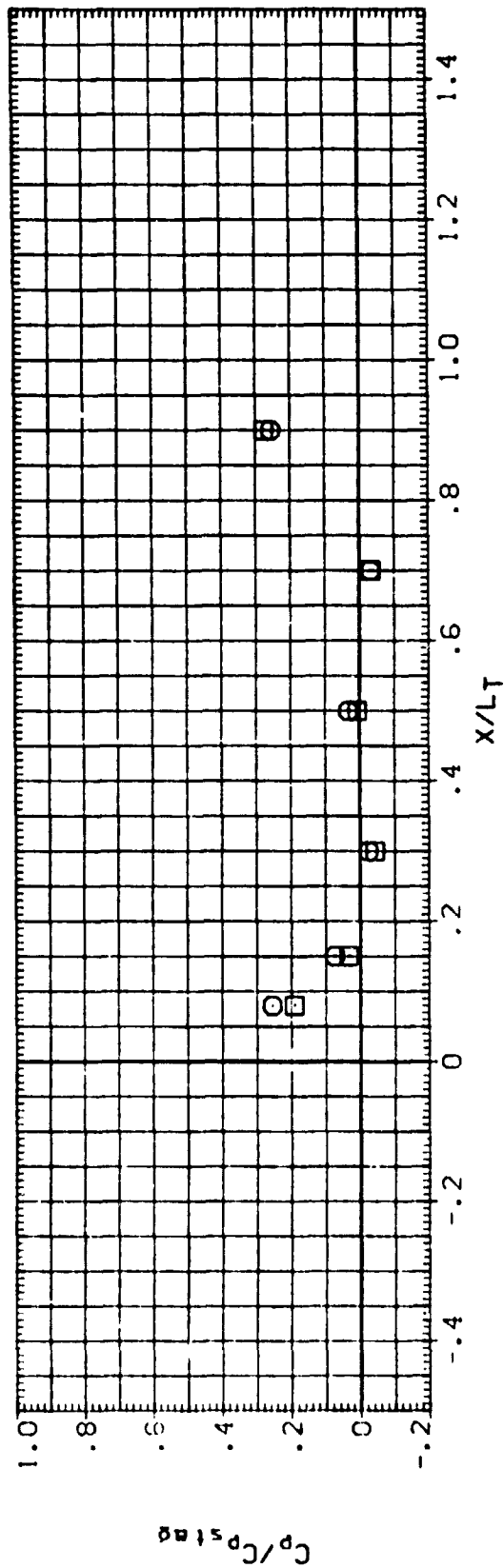


FIG. 20 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH 2.950

THETA 67.500

ALPHA 5.000

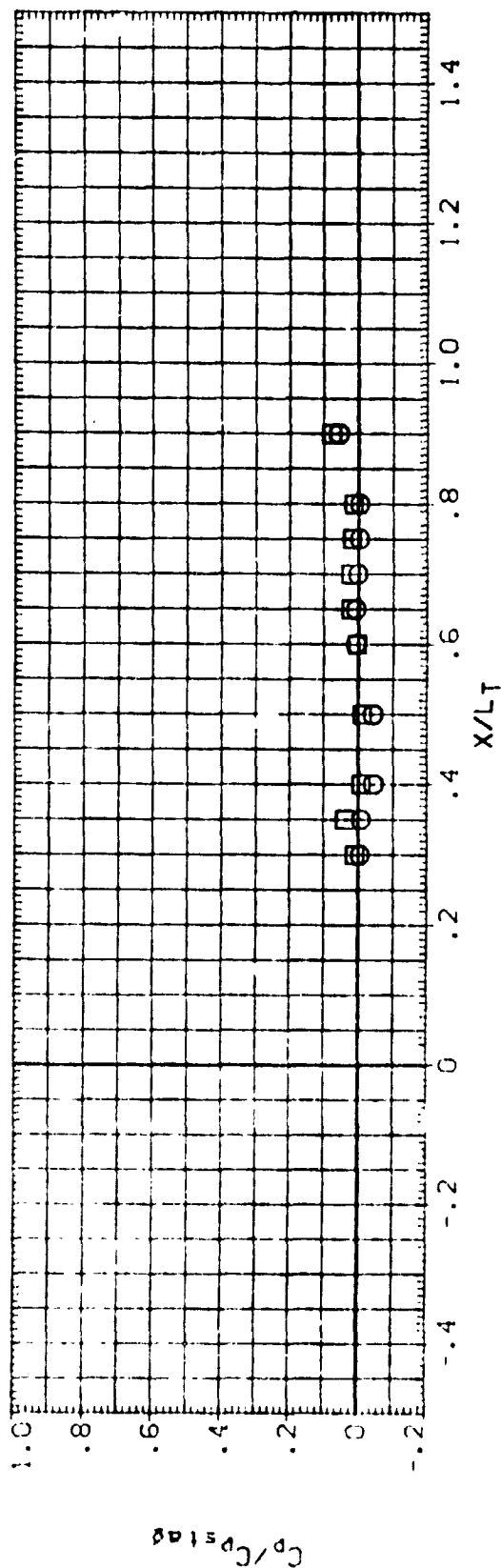
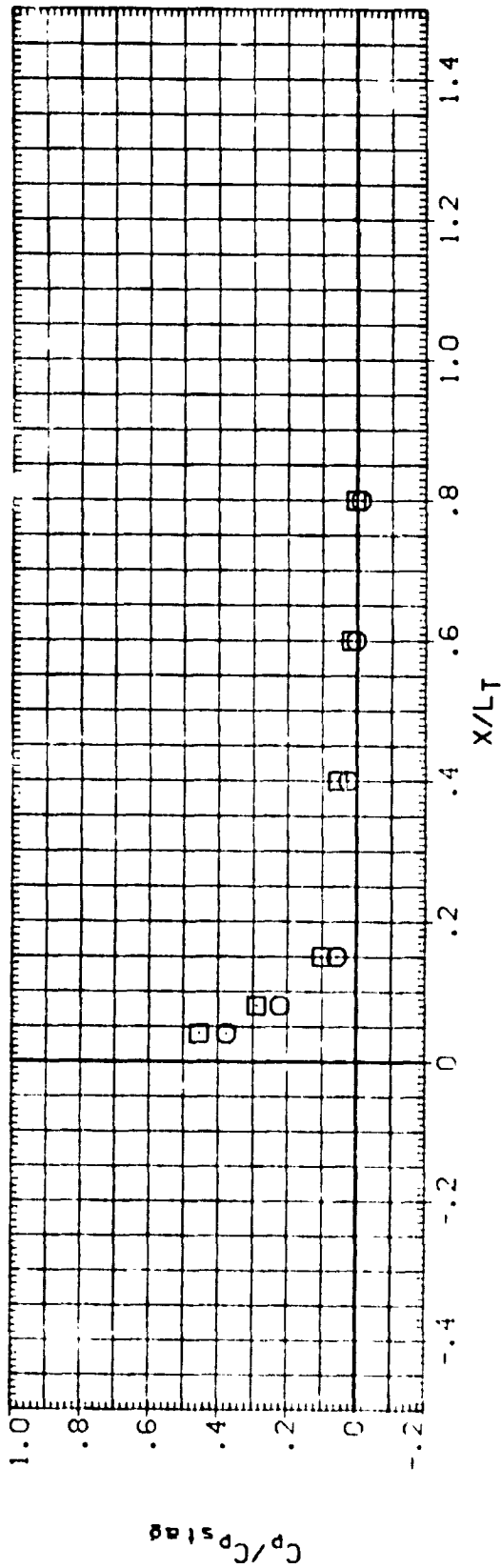


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(RQ3TAB) UFWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	BETA	MACH	RN/L	PARAMETRIC VALUES
□	.000	112.500	2.950		3.000 BETA .000
	5.000	90.000			

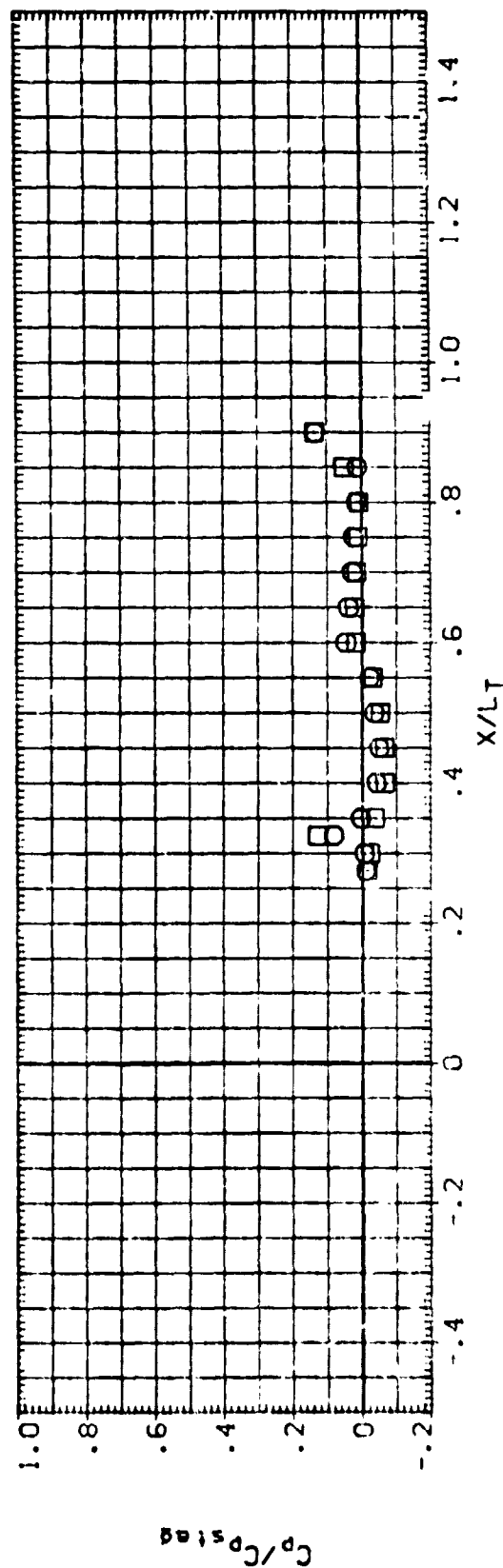
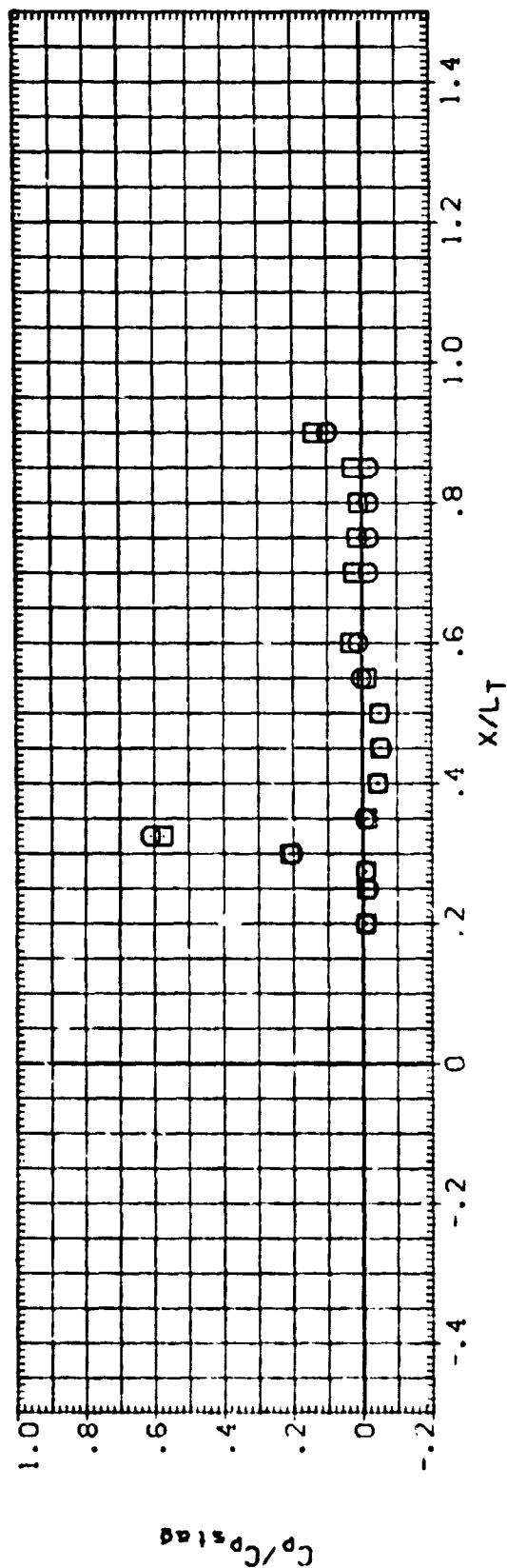


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 .000 135.000 2.950
 5.000 123.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

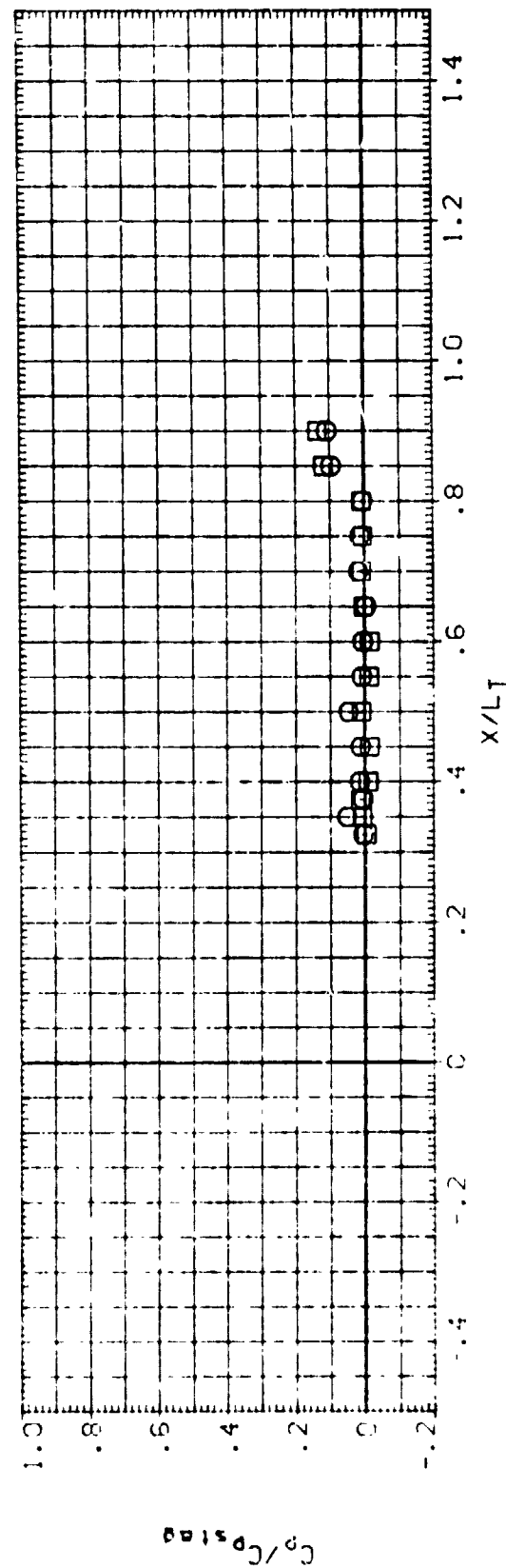
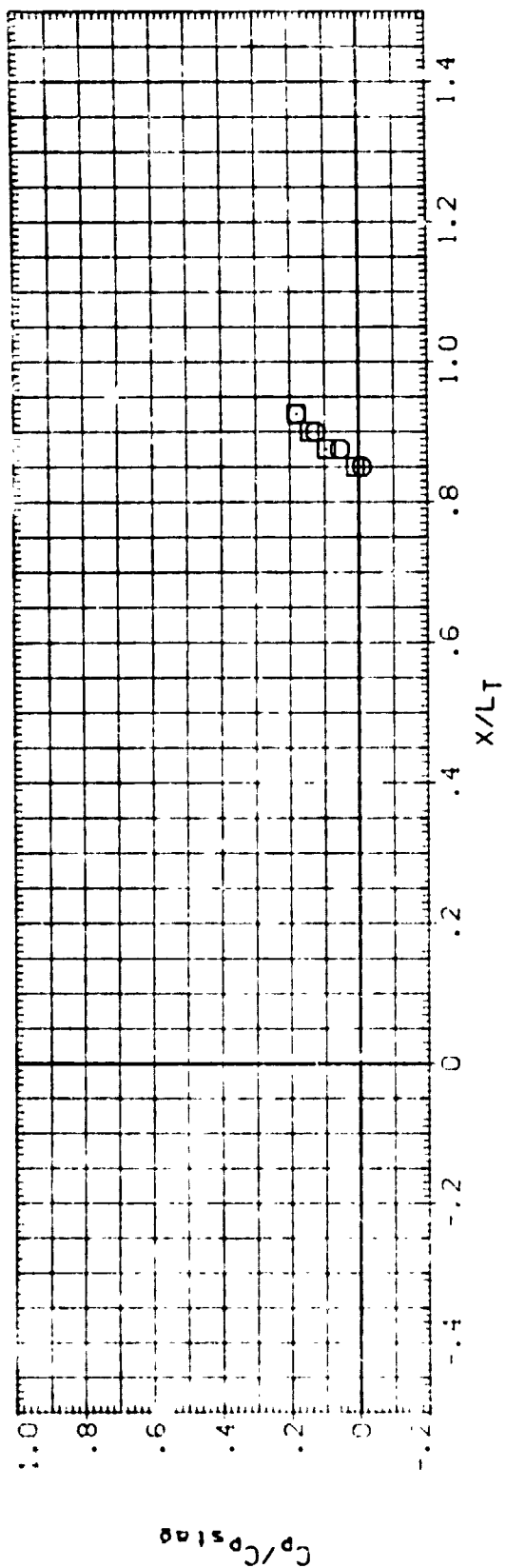


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA: 0. RN/L= 3.0

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(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	PARAMETRIC VALUES
□	5.000	180.000	2.950	3.000
		157.500		BETA
				.000

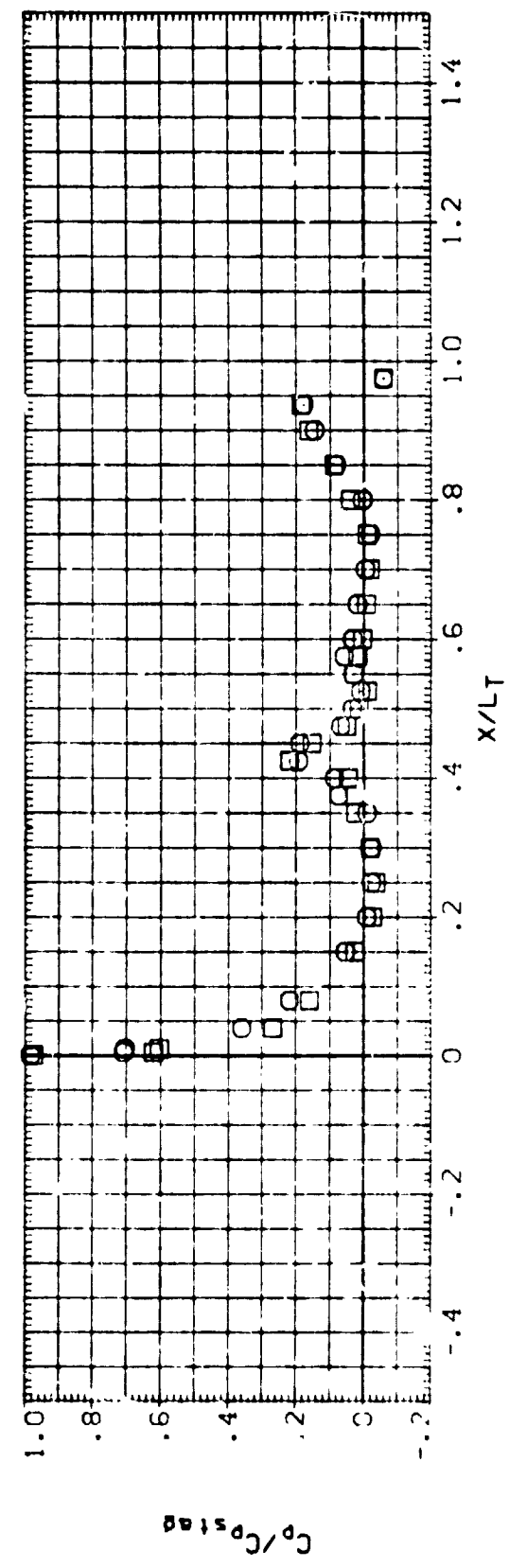
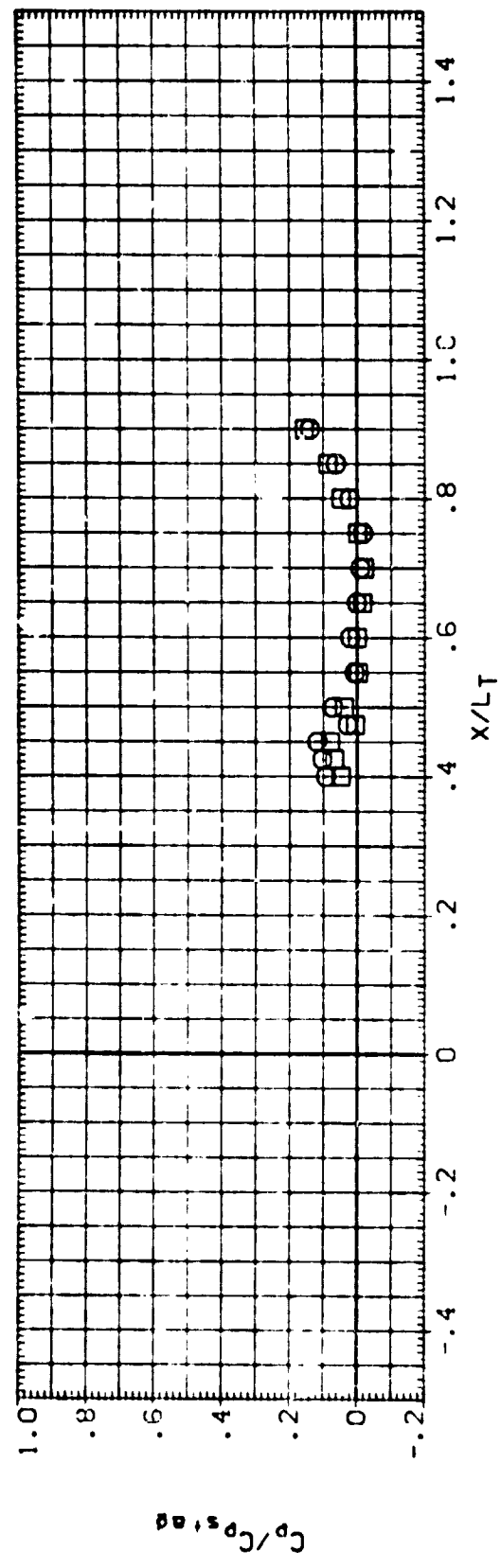


FIG. 20 VARIATION OF C_p/C_{pstag} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. $RN/L = 3.0$

[RQ3'13] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 5.000 213.000 2.950

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

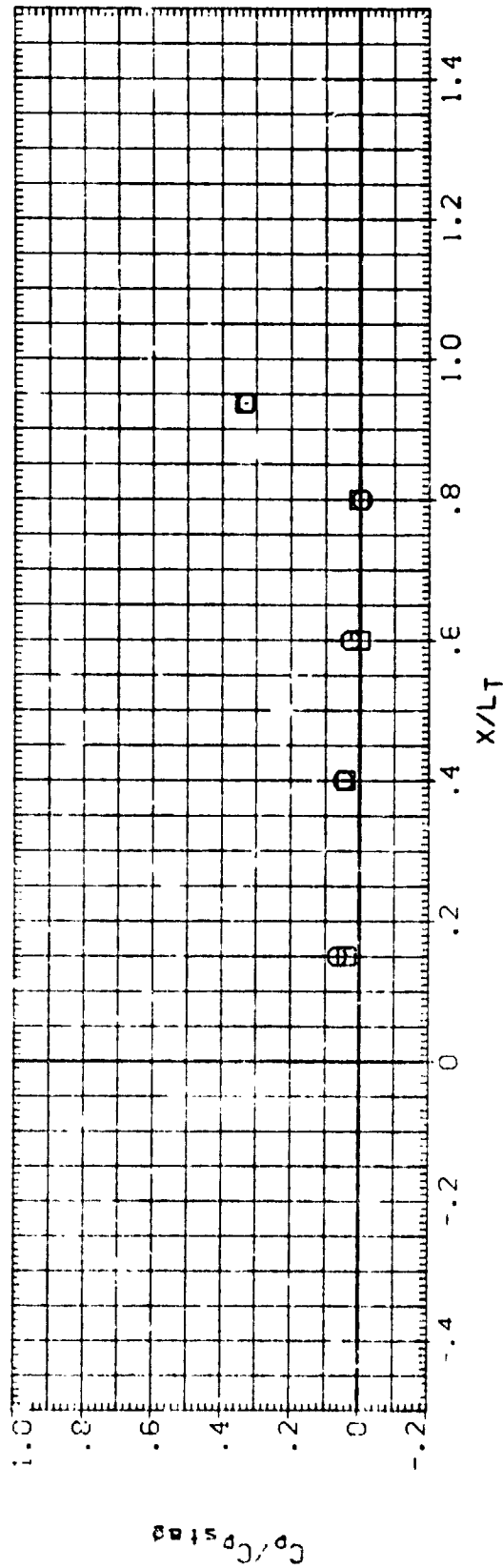
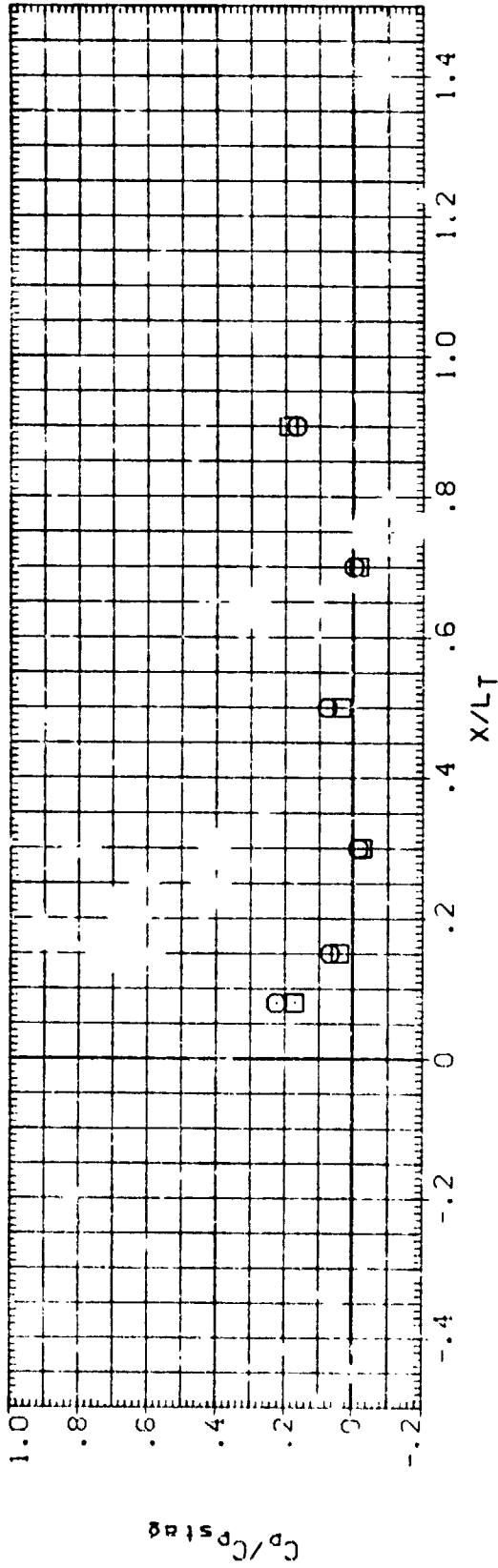


FIG. 20 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK, BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-SEN16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -10.000 67.500 3.700
 -5.000 .000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

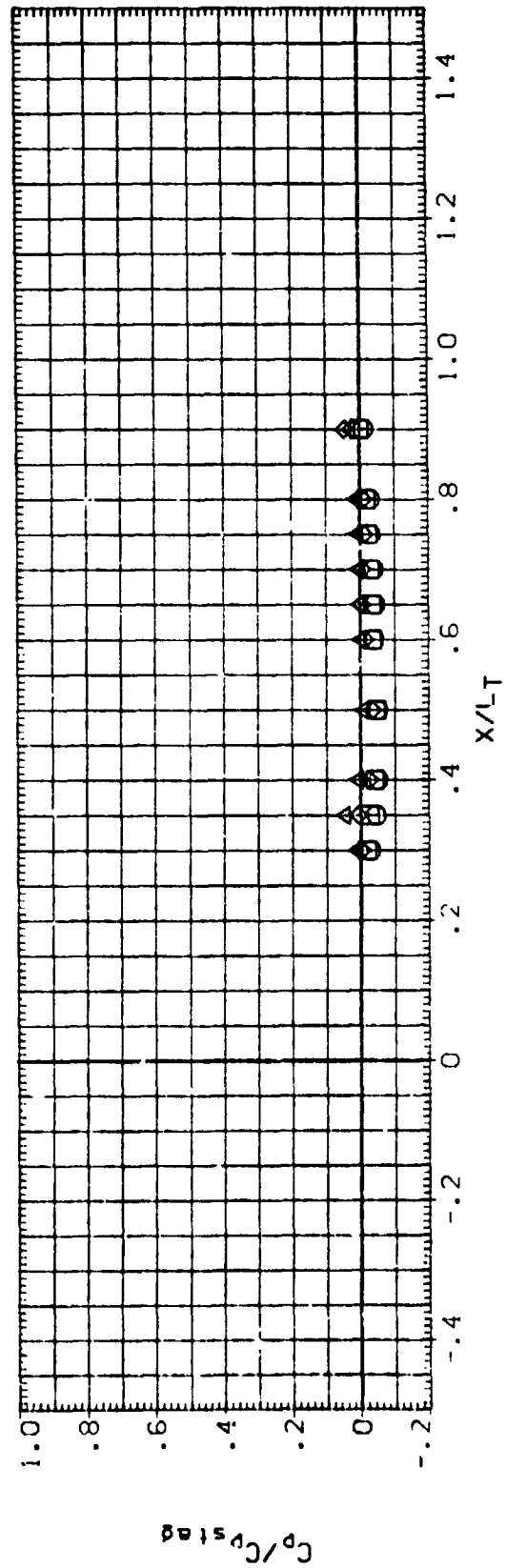
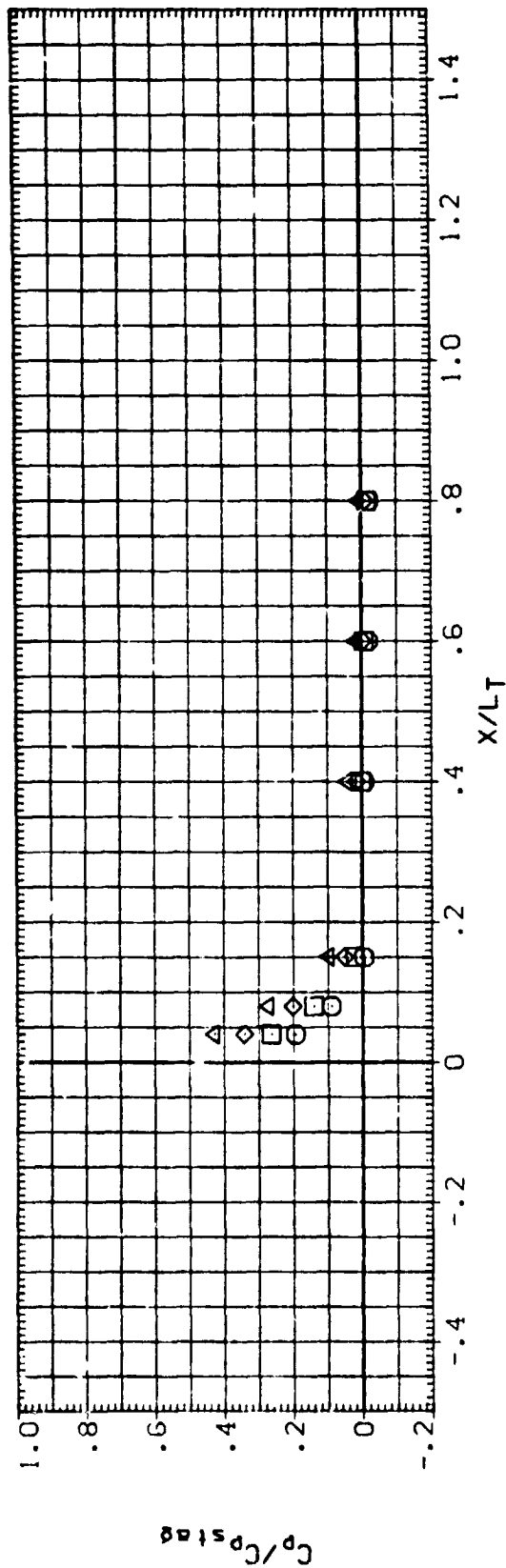


FIG. 20 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0, RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -10.000 112.500 3.700
 -5.000 90.000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

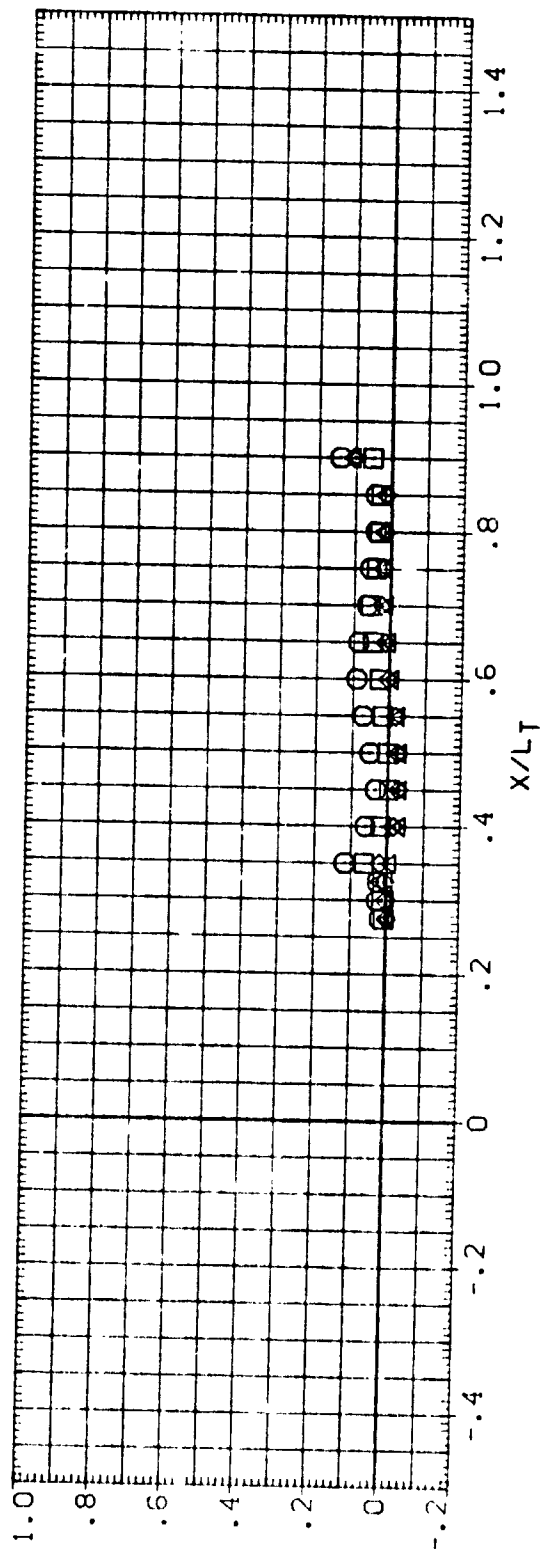
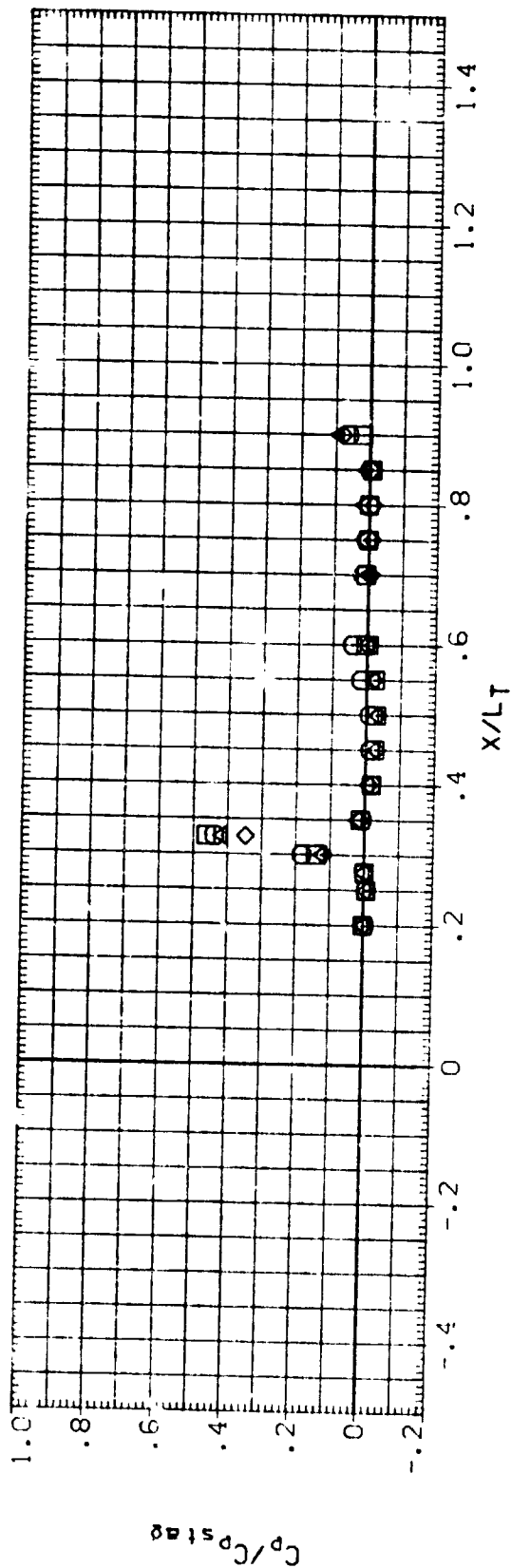


FIG. 20 VARIATION OF $C_p/C_{p_{stag}}$ ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK, BETA= 0. RN/L= 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	RN/L	PARAMETRIC VALUES
	-10.000	135.000	3.700		3.000 BETA .000
	-5.000	123.000			
	5.000				

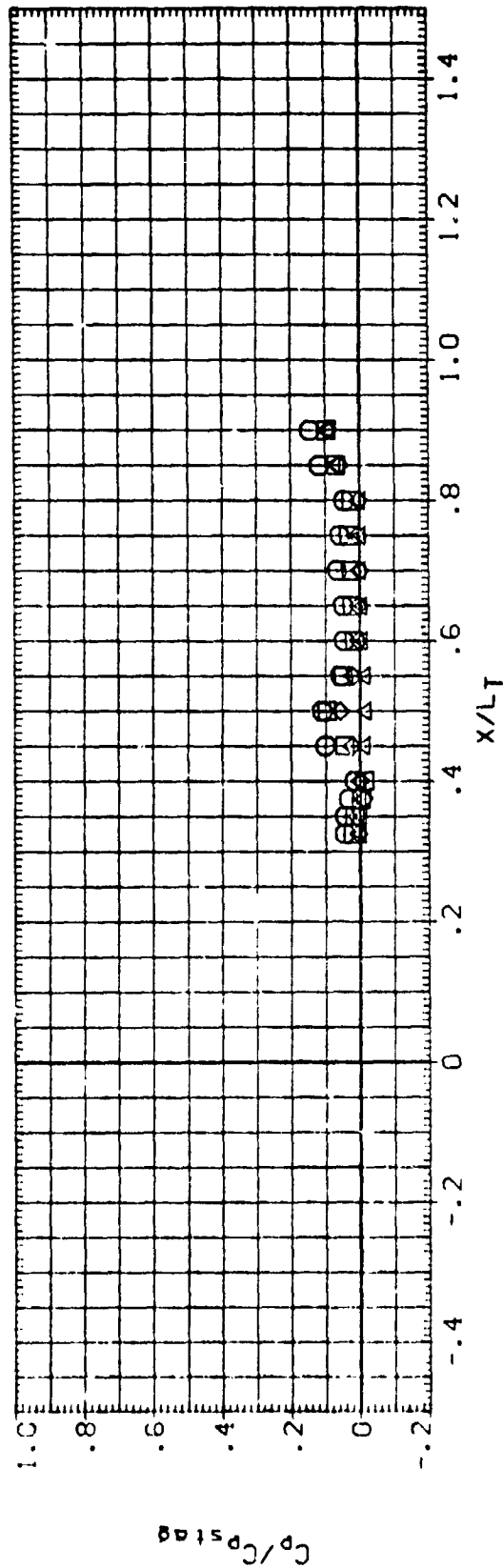
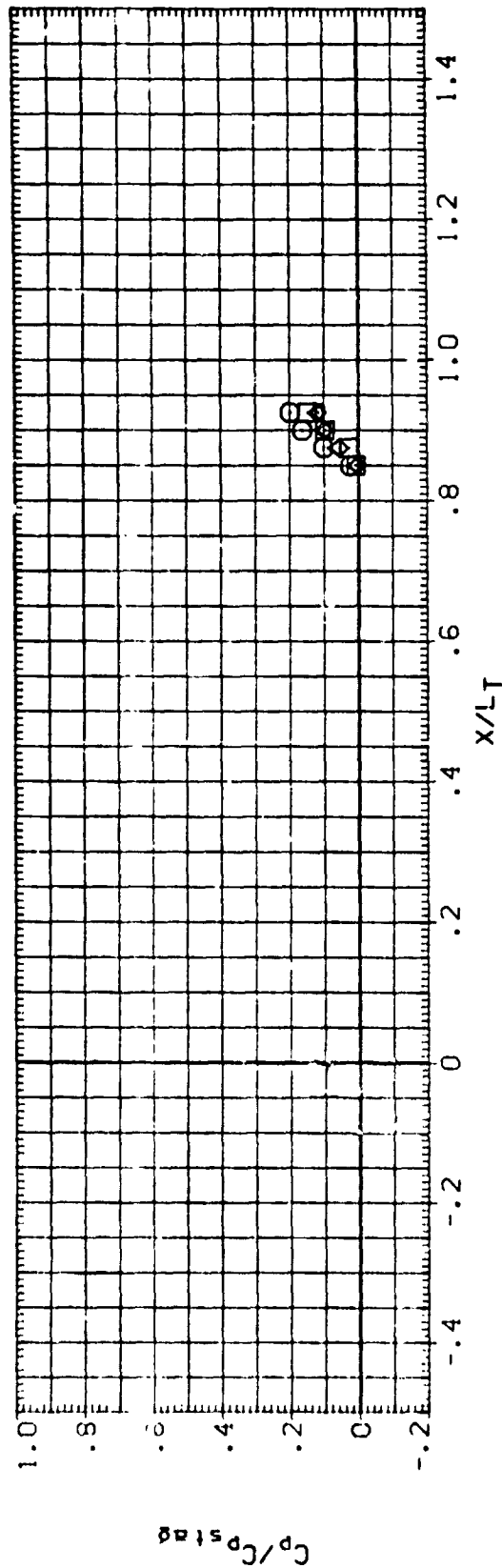
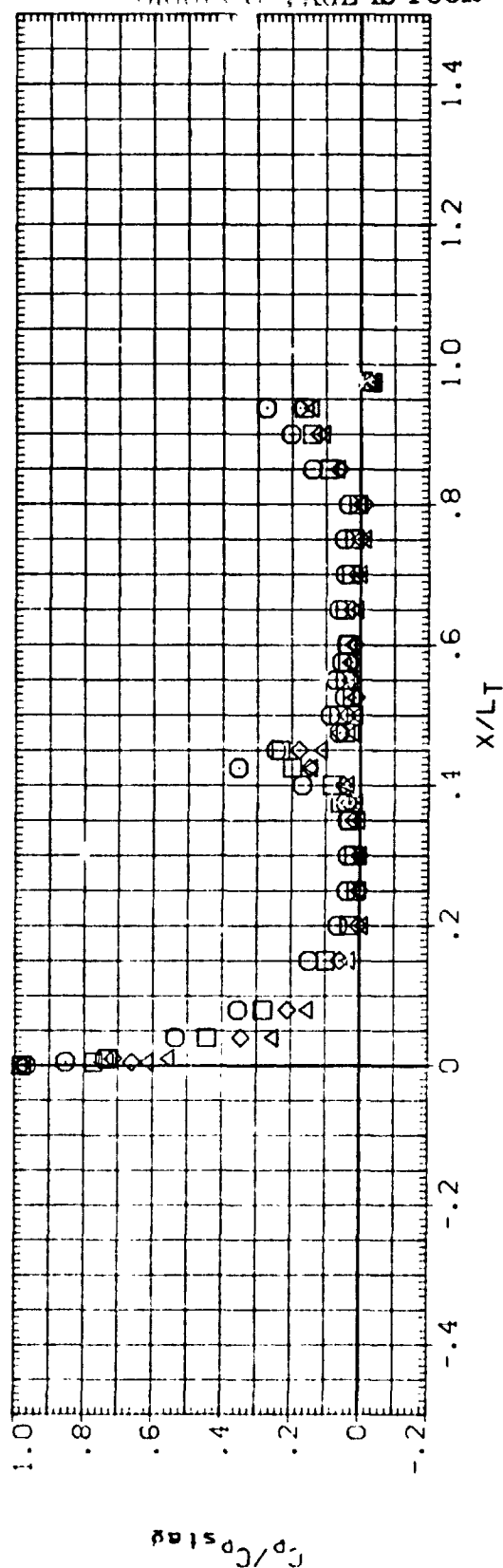
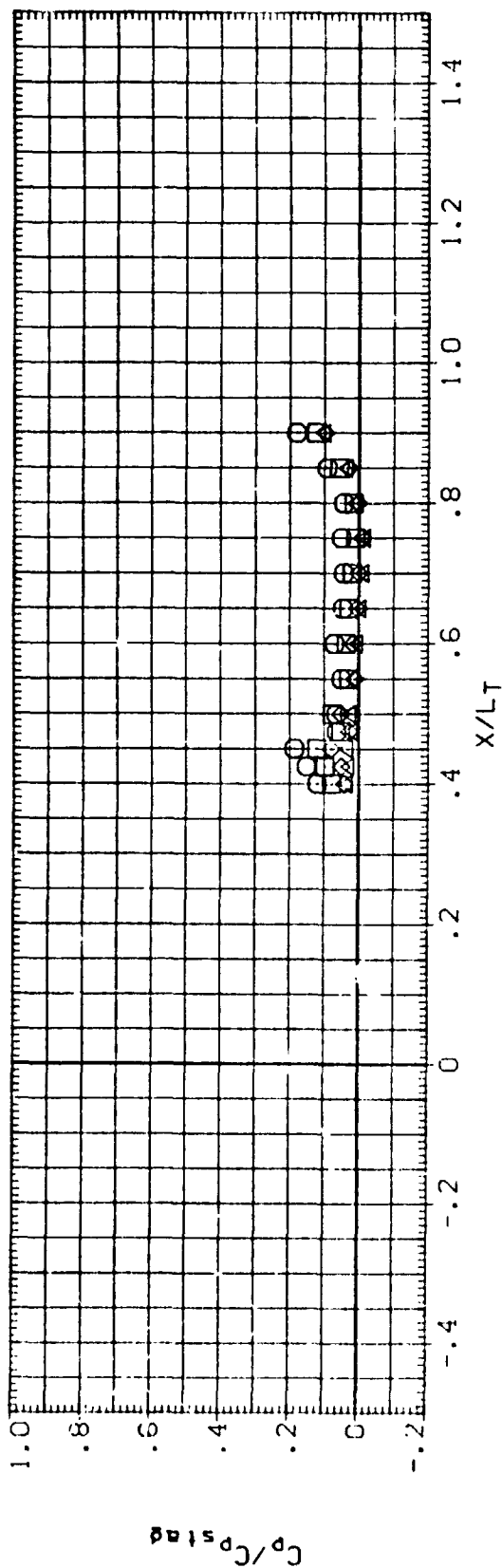


FIG. 20 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SWGL ALPHA THETA MACH
 -10.000 180.000 3.700
 -5.000 157.500
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000



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 ORIGINAL PAGE IS POOR

FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA
 -10.000
 -5.000
 .000
 5.000

THETA MACH
 210.000 3.700
 197.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

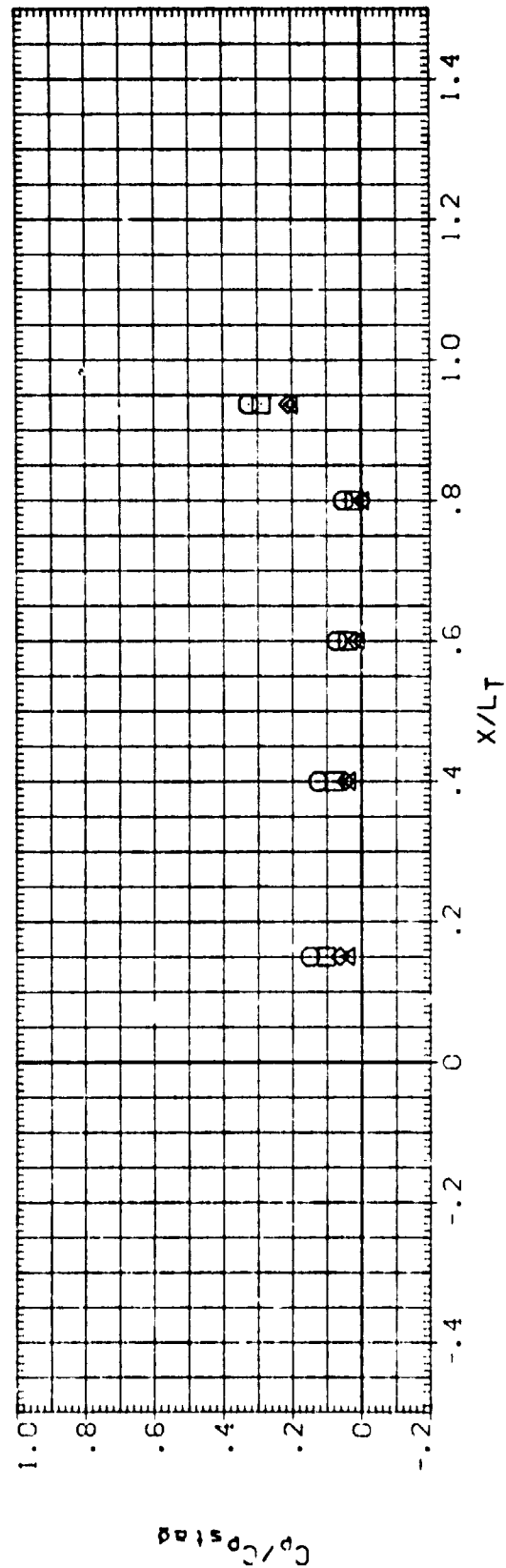
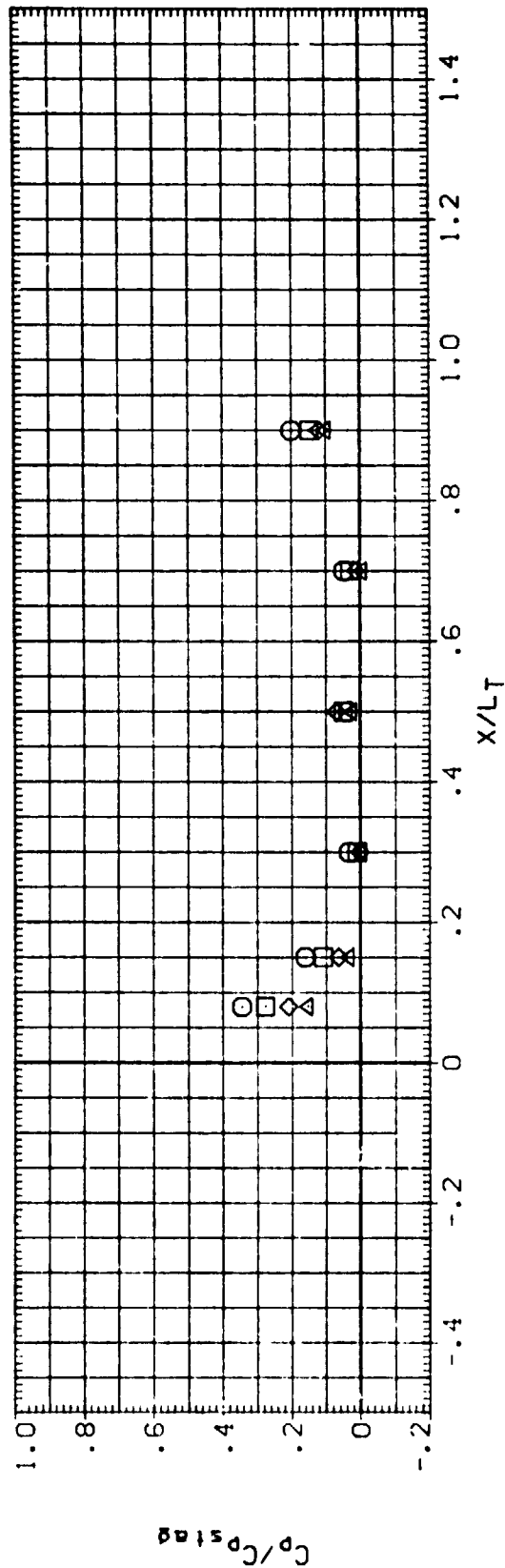


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N18 EXTERNAL TANK

SYMBOL

ALPHA

THETA

MACH

-10.000 67.500 4.600

-5.000 .000

.000 5.000

PARAMETRIC VALUES
3.000 BETA .000

RN/L

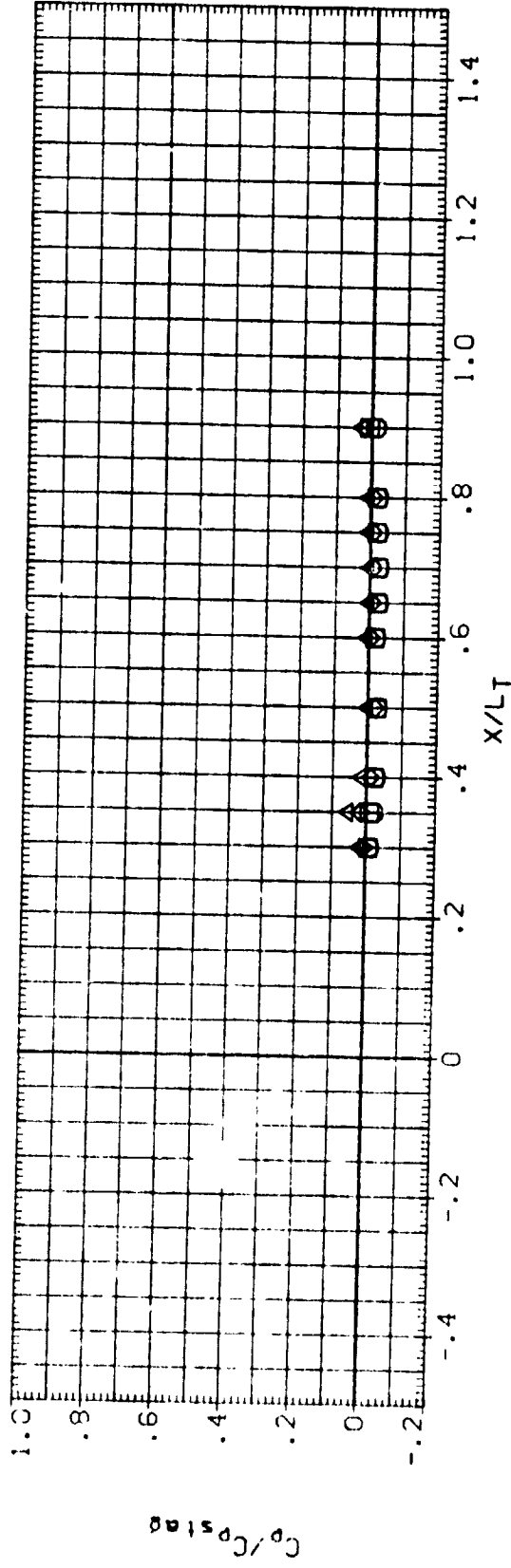
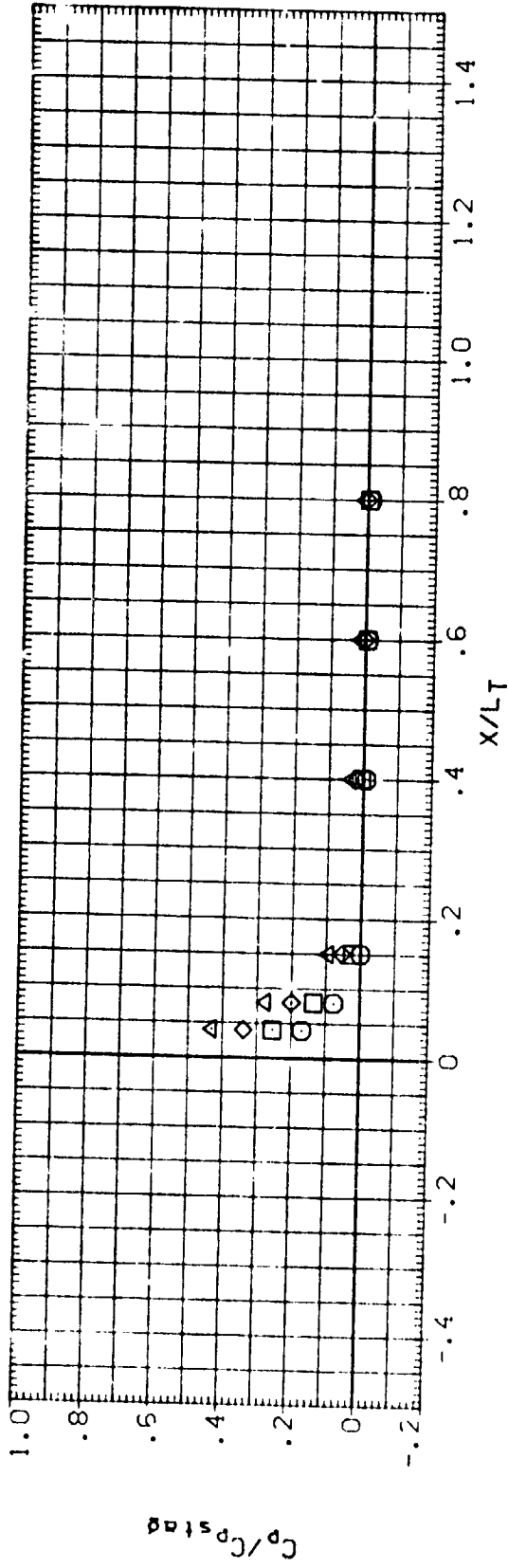


FIG. 20 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, BETA = 0, RN/L = 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA		T-META		MACH	RN/L	PARAMETRIC VALUES	
	-10.000	112.500	-5.000	90.000			3.000	BETA
	.000		.000		4.600			.000
	5.000							

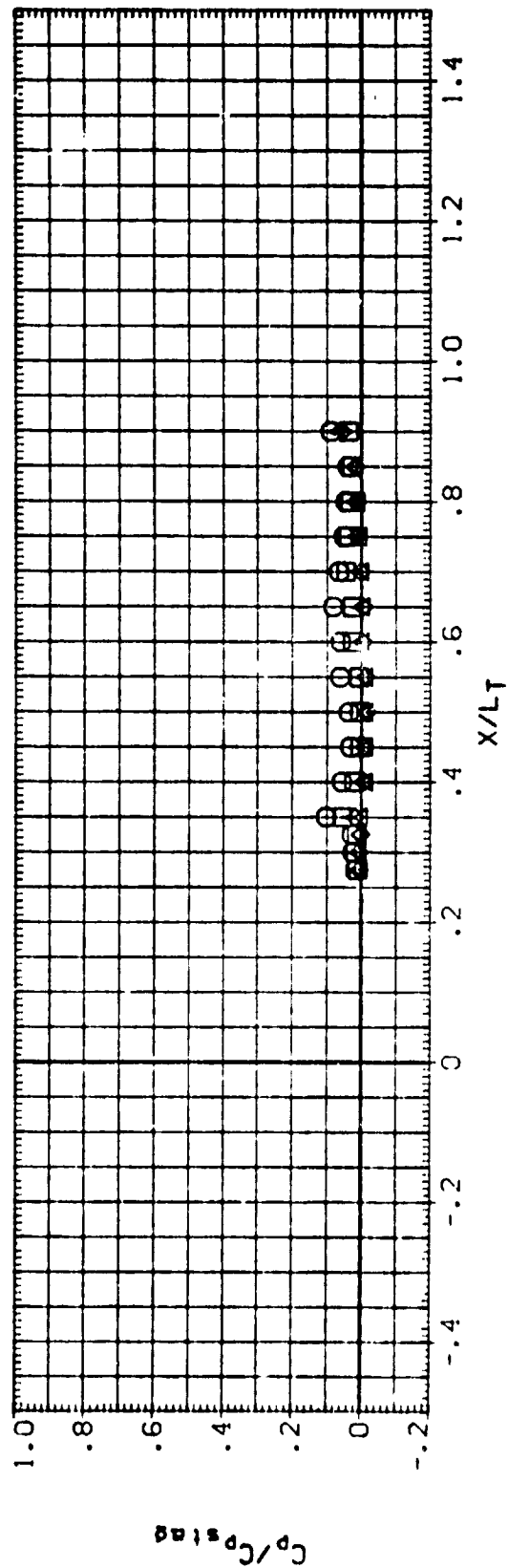
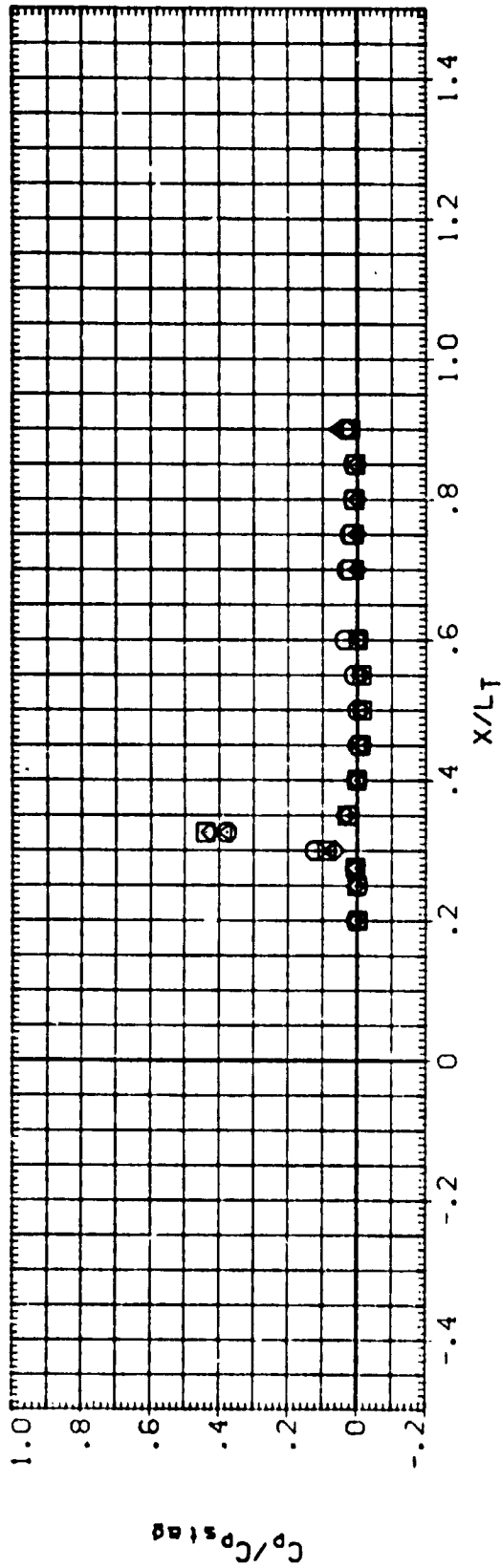
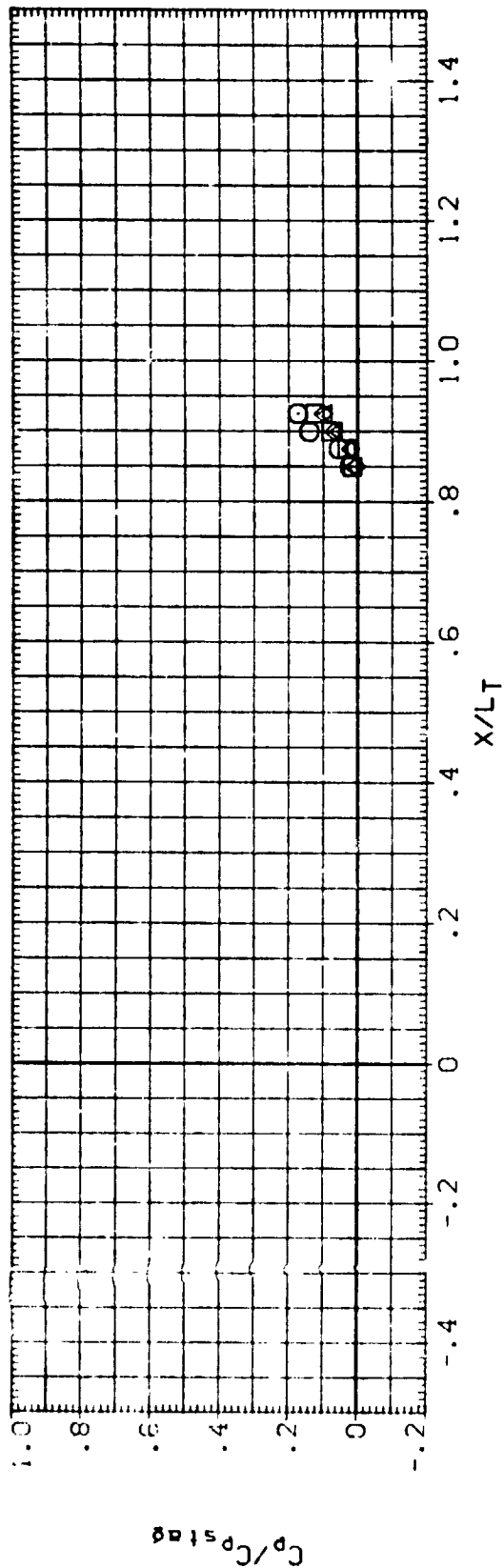


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK, BETA= 0. RN/L= 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THE1A HACH
 -10.000 135.000 4.500
 -5.000 123.000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000



REPRODUCIBILITY OF THE
 ORIGINAL PAGE IS POOR

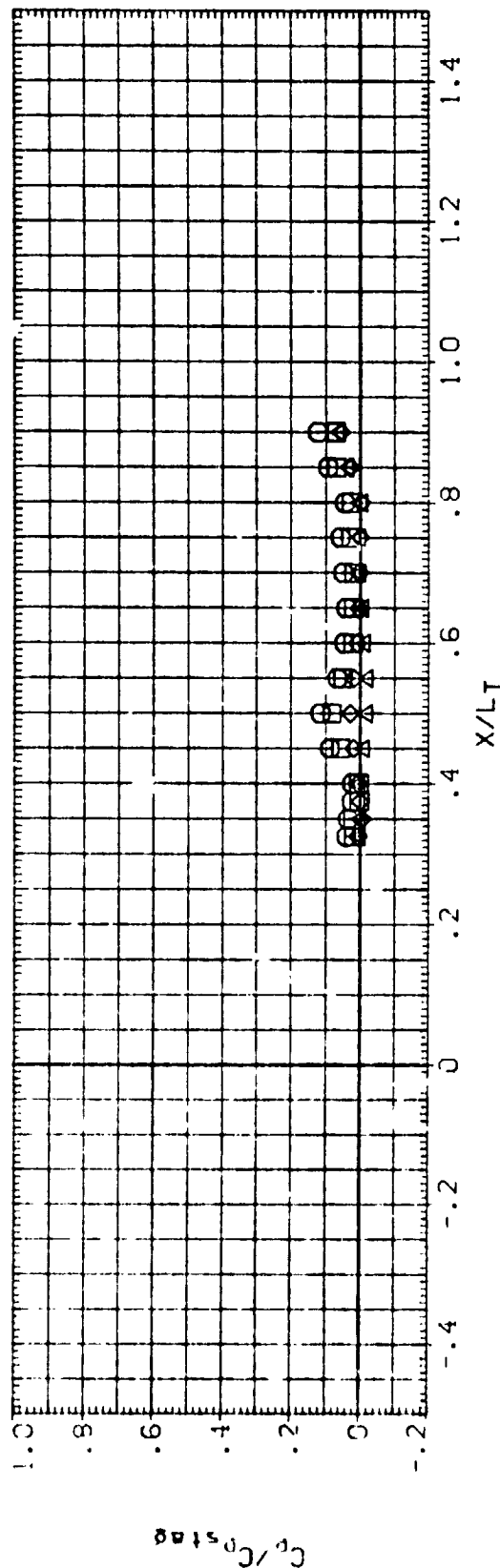


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -10.000 180.000 4.600
 -5.000 157.500
 5.000

PARAMETRIC VALUES
 3.000 BETA .000
 RN/L

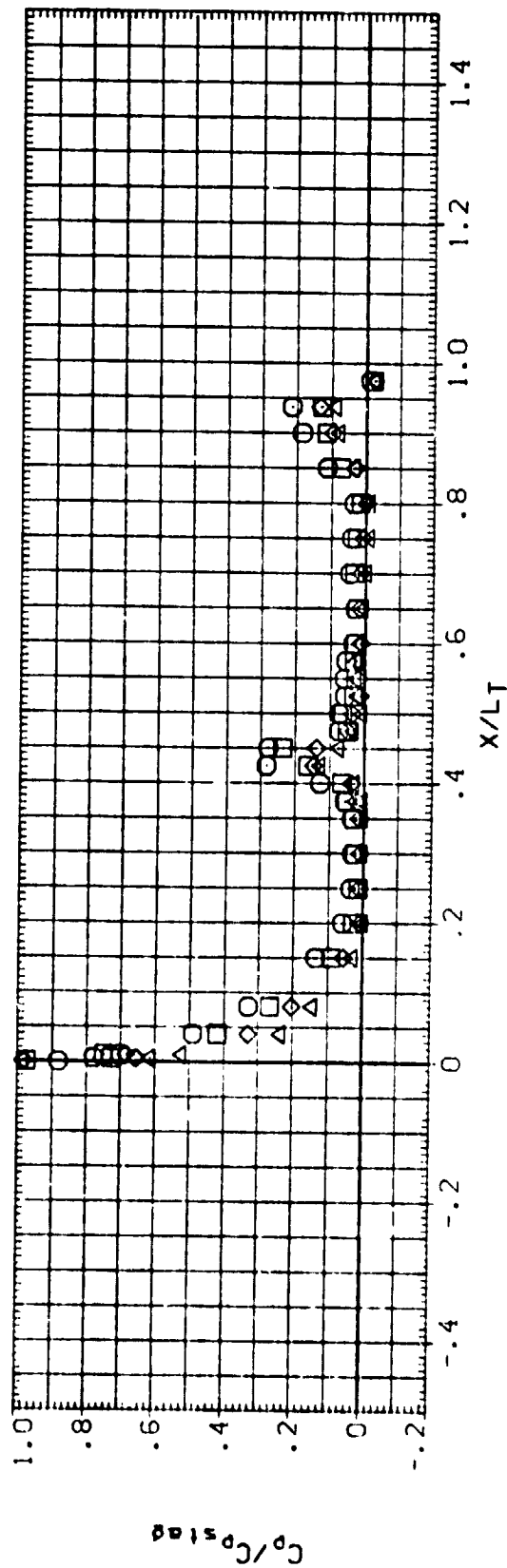
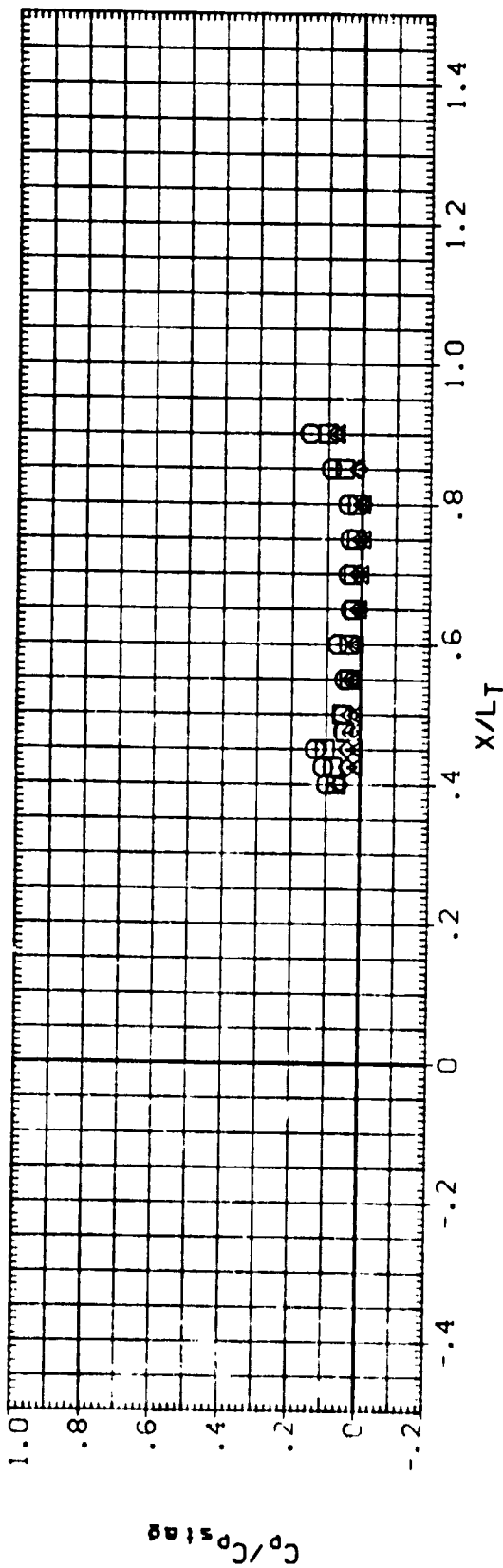


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -10.000 210.000 4.600
 -5.000 197.000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

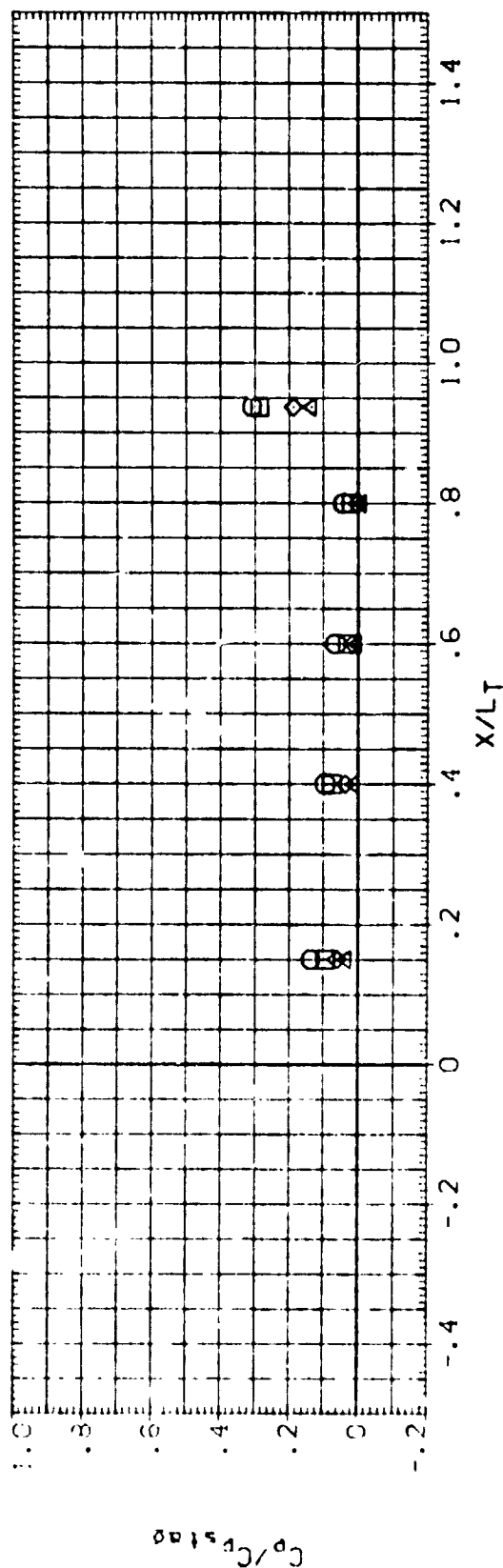
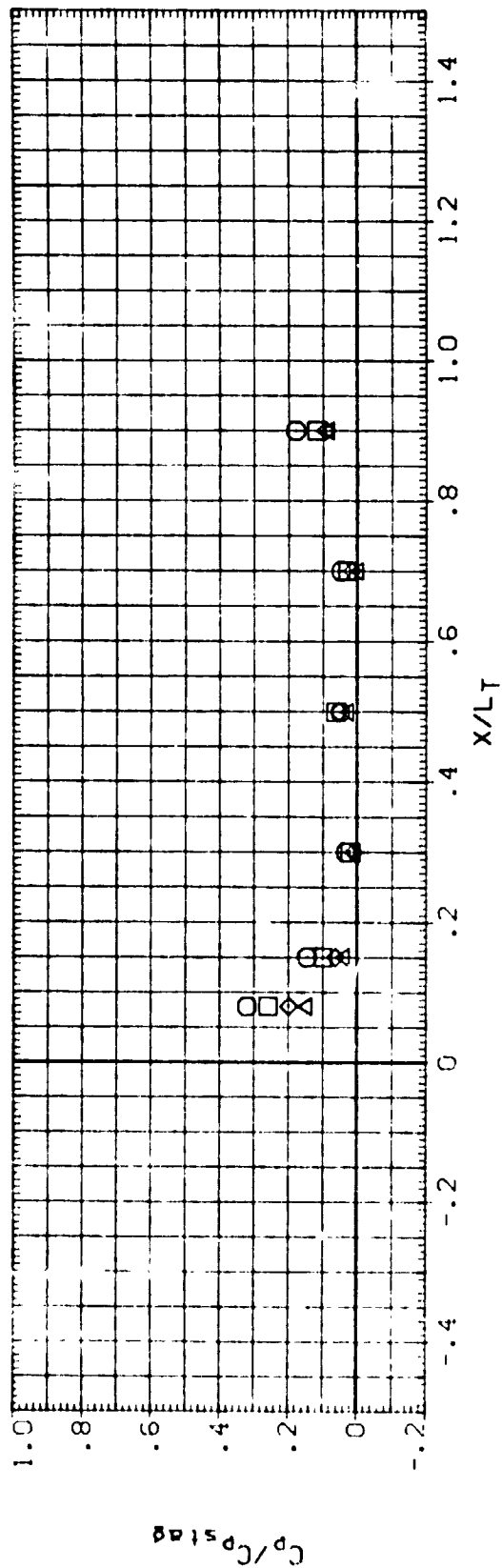


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(RG3TAB) UPWT 1059 (IH4) 01-T15-S&H16 EXTERNAL TANK

SYMBOL	ALPHA	X/L	MACH	RN/L	PARAMETRIC VALUES
8	.000	.350	2.360		3.000 BETA .000
	5.000	.300			

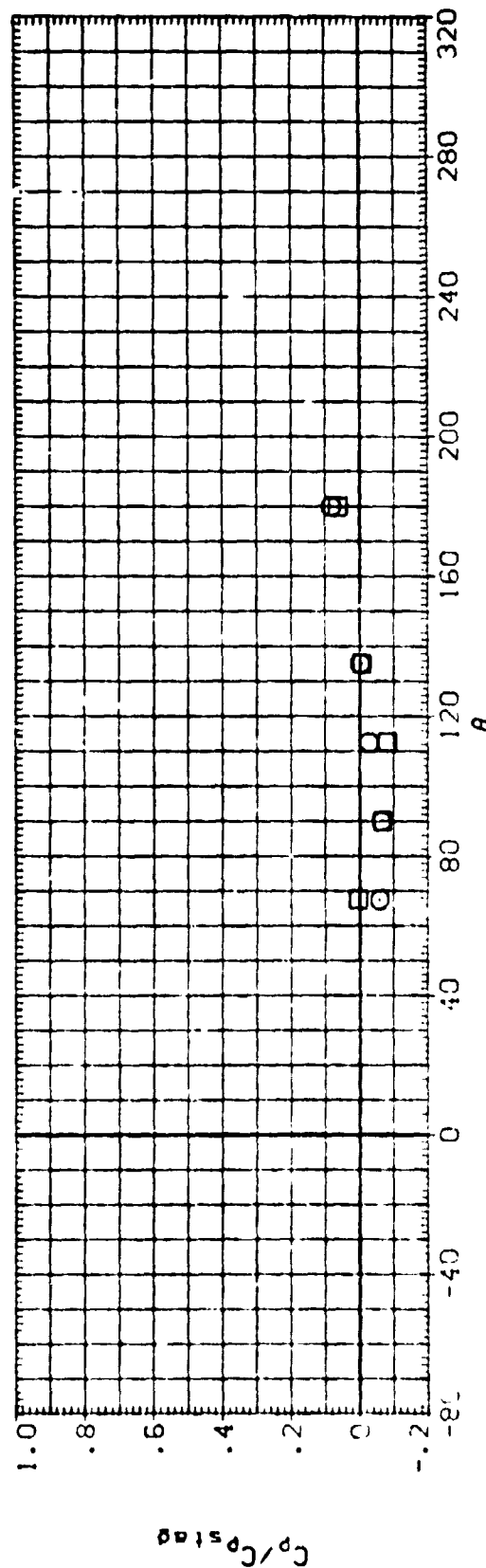
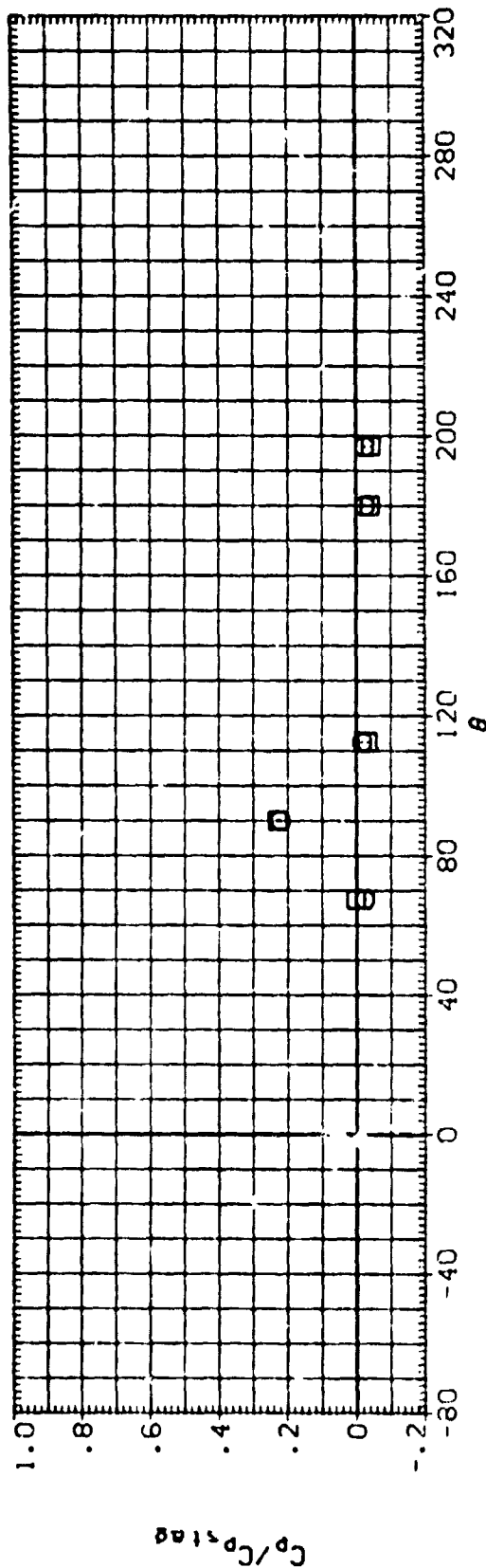


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 0.000 .500 2.363
 5.000 .400

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

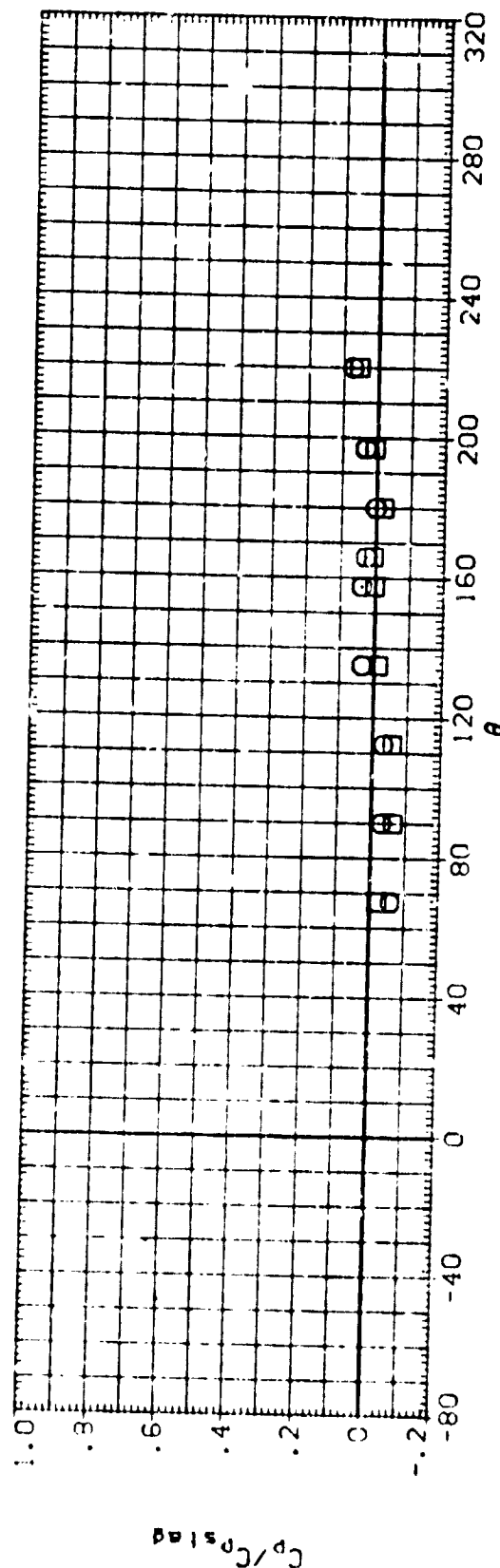
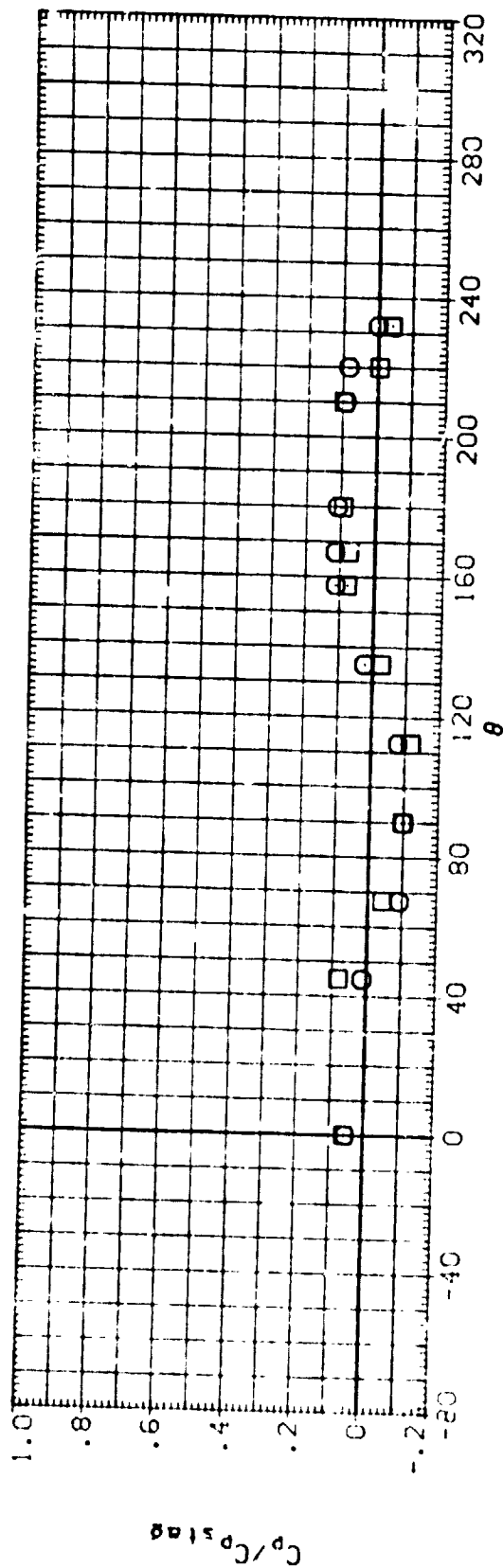


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. $BETA = 0$, $RN/L = 3.0$

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(R03TAB) UPWT 1059 (IH4) 01-715-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 0 .300 .600 2.360
 1 5.000 .550

PARAMETRIC V. θ
 3.000 BE. .000

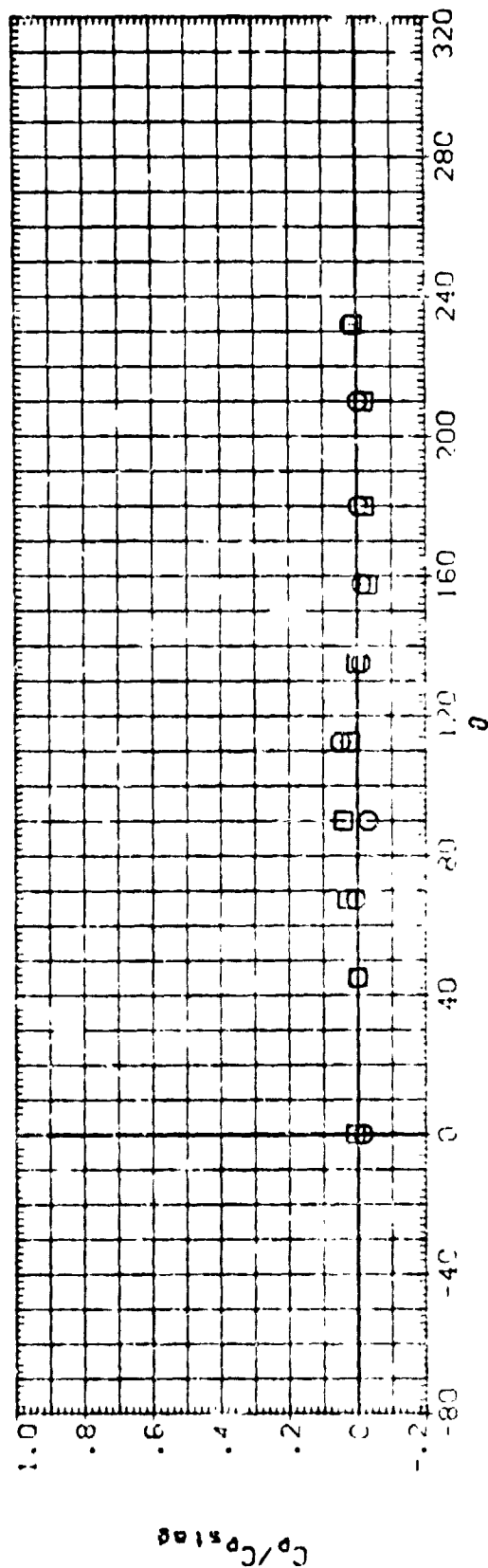
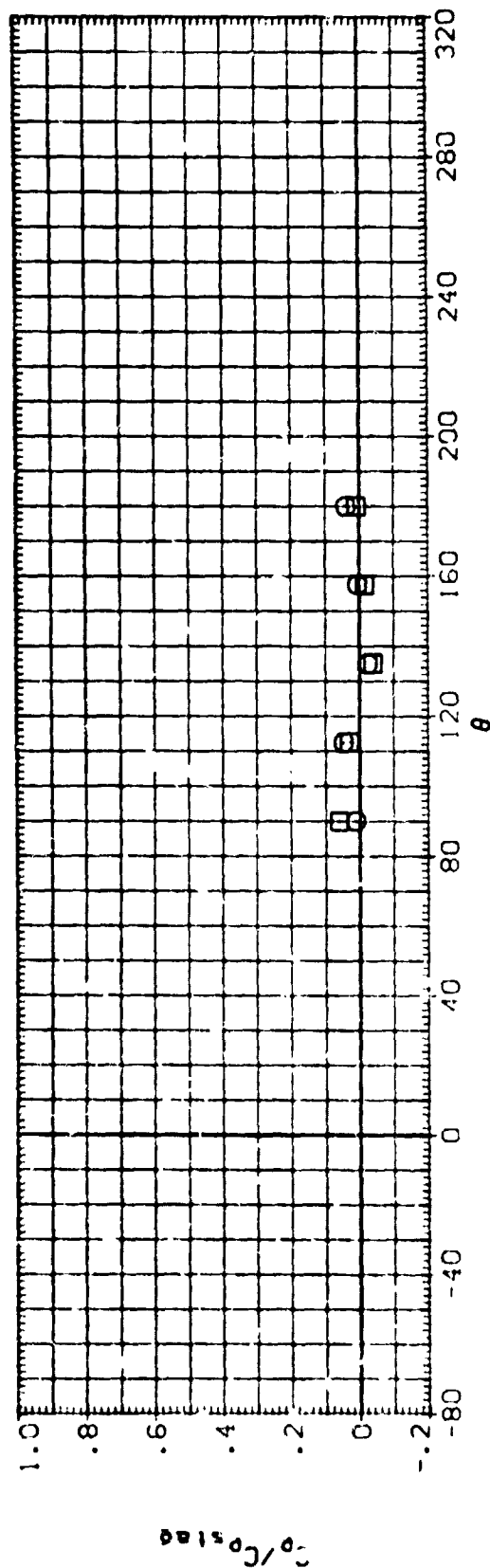


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH $\theta = 15^\circ$. EXTERNAL TANK. $BETA = 0^\circ$. $RN/L = 3.0$

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL

ALPHA
0.000
5.000

X/LT
.700
.650

MACH
2.360

PARAMETRIC VALUES

3.000

BETA

.000

RN/L

C-4

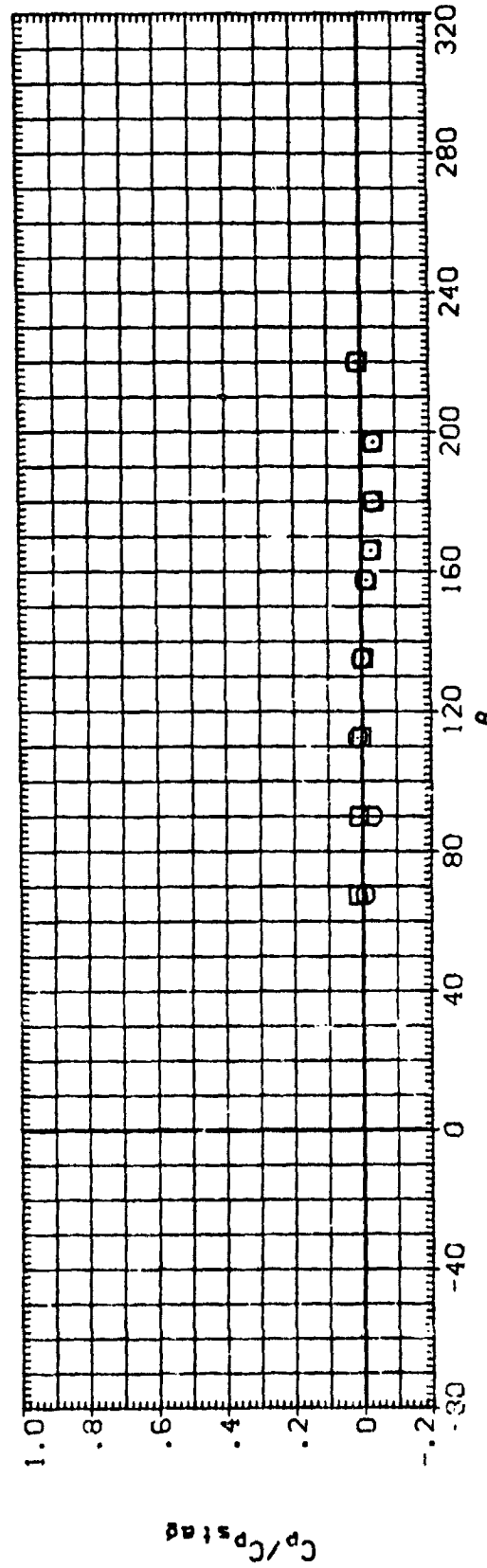
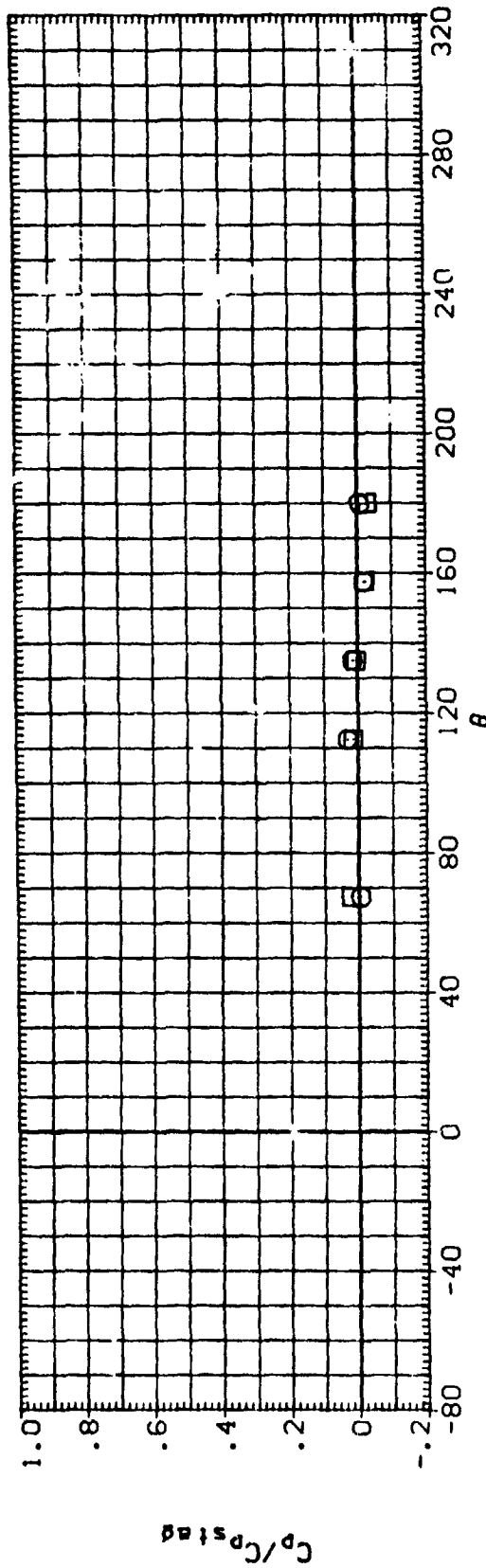


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 0 .000 .800 2.360
 1 5.000 .750

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

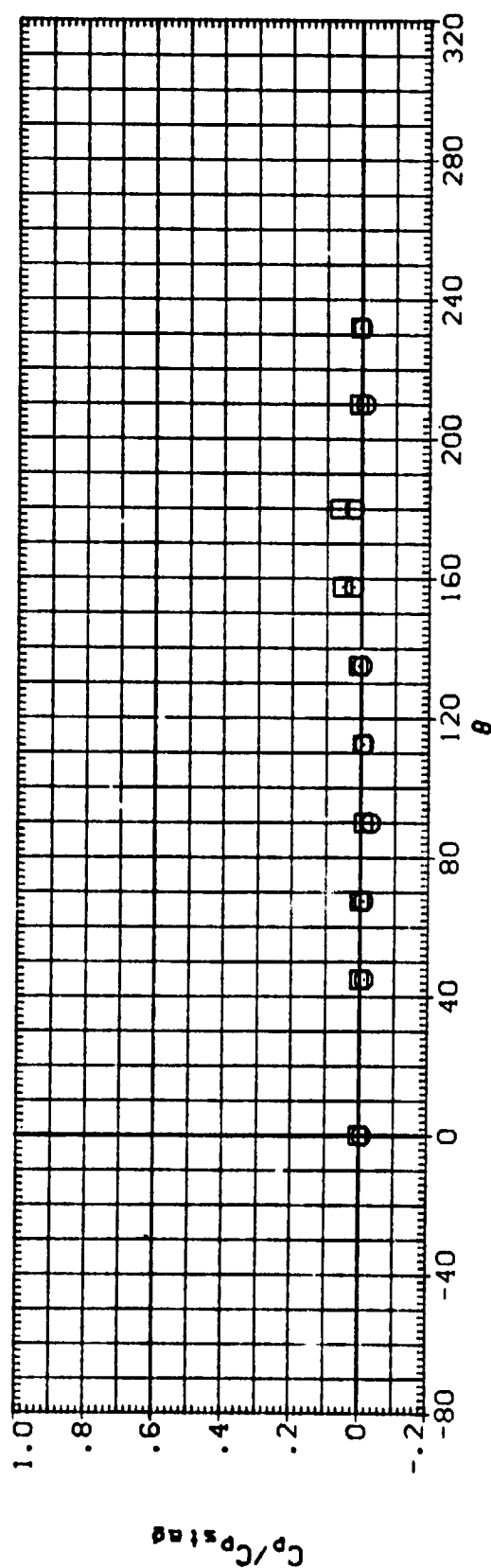
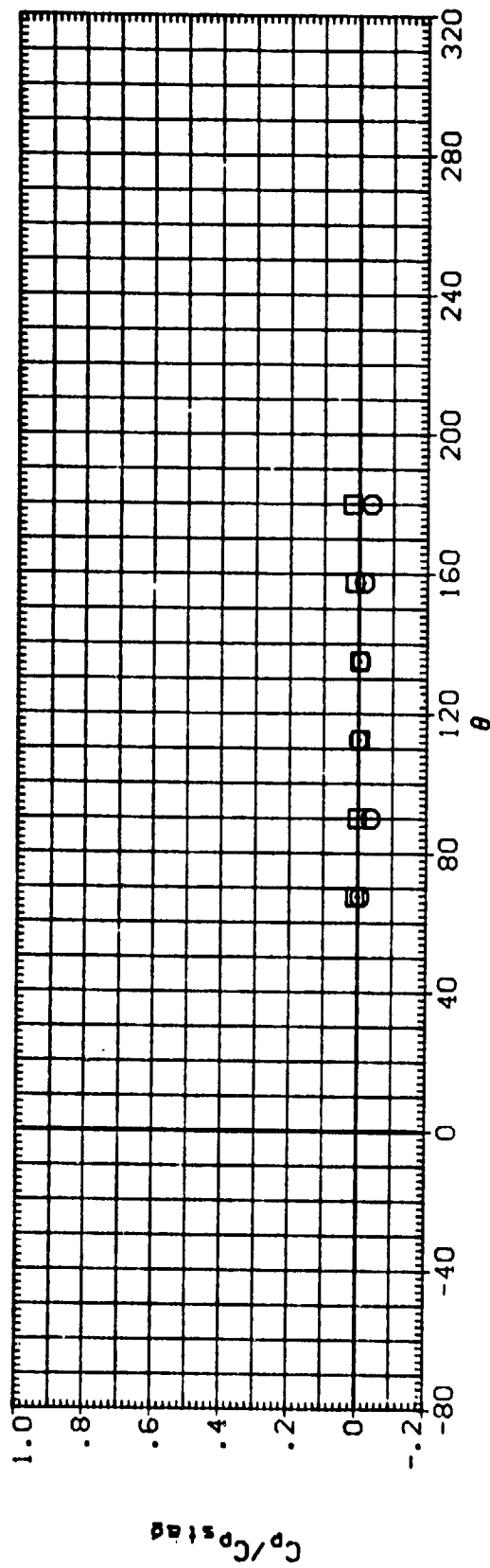


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL 

ALPHA
.000
5.000

X/LT
.900
.850

MACH
2.360

PARAMETRIC VALUES
3.000 BETA

RN/L

.000

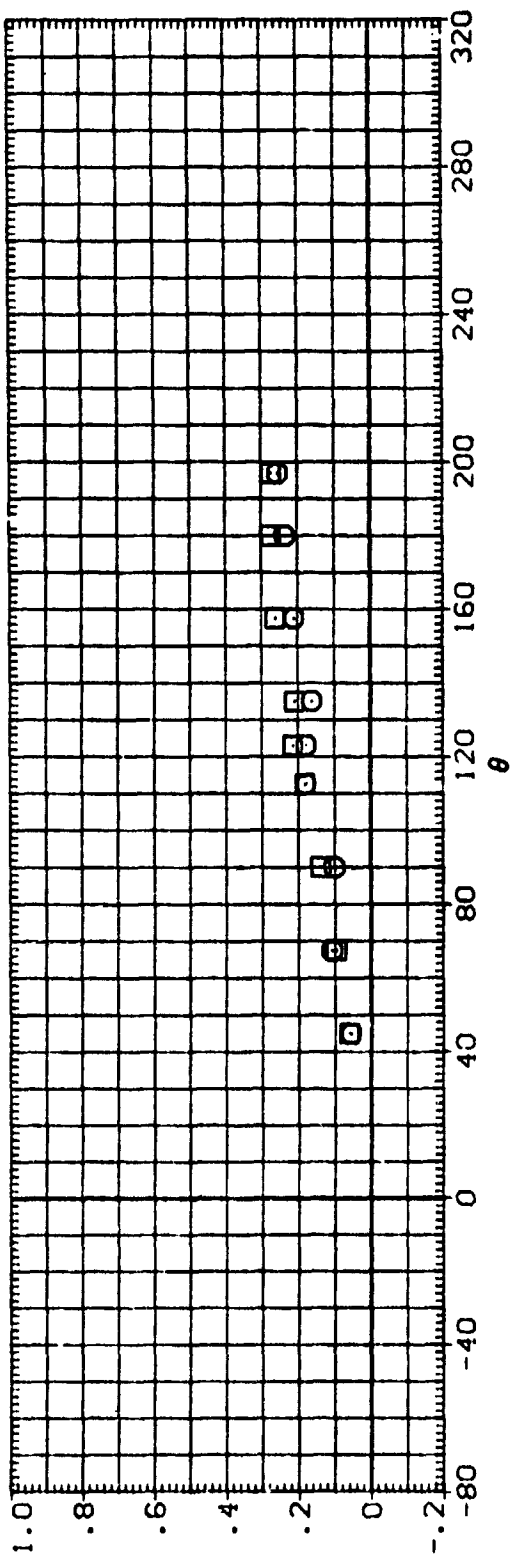
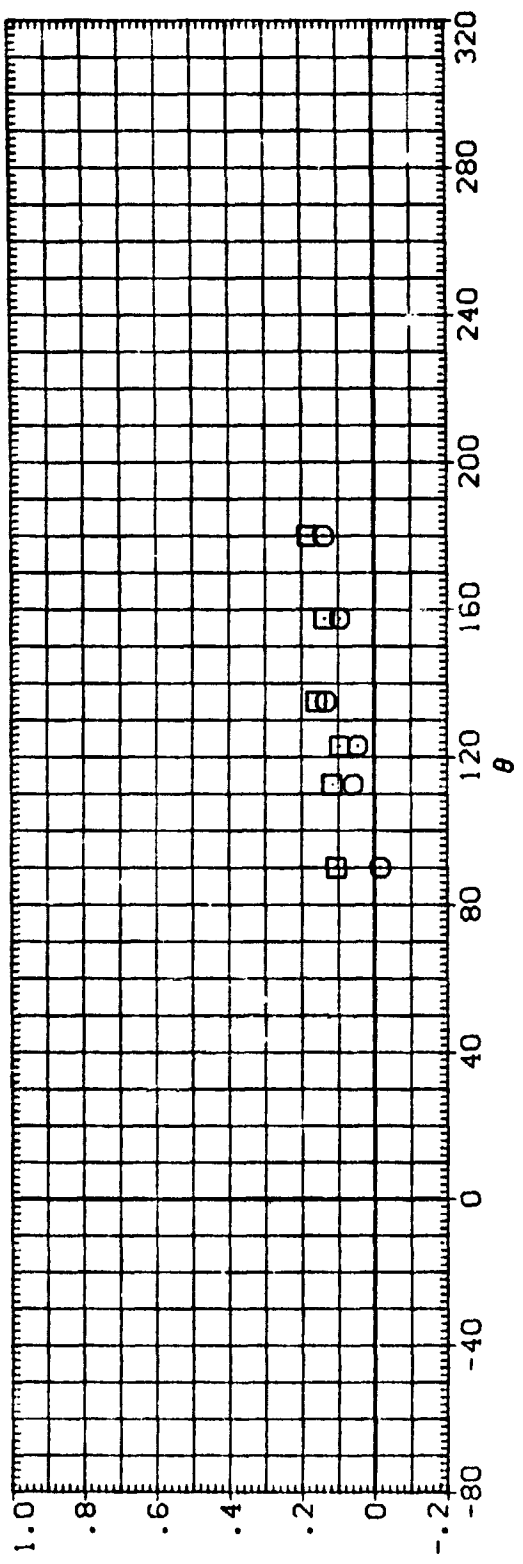


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK, BETA= 0, RN/L= 3.0



(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
□ .000 .350 2.950
□ .500 .300

PARAMETRIC VALUES
RN/L 3.000 BETA .000

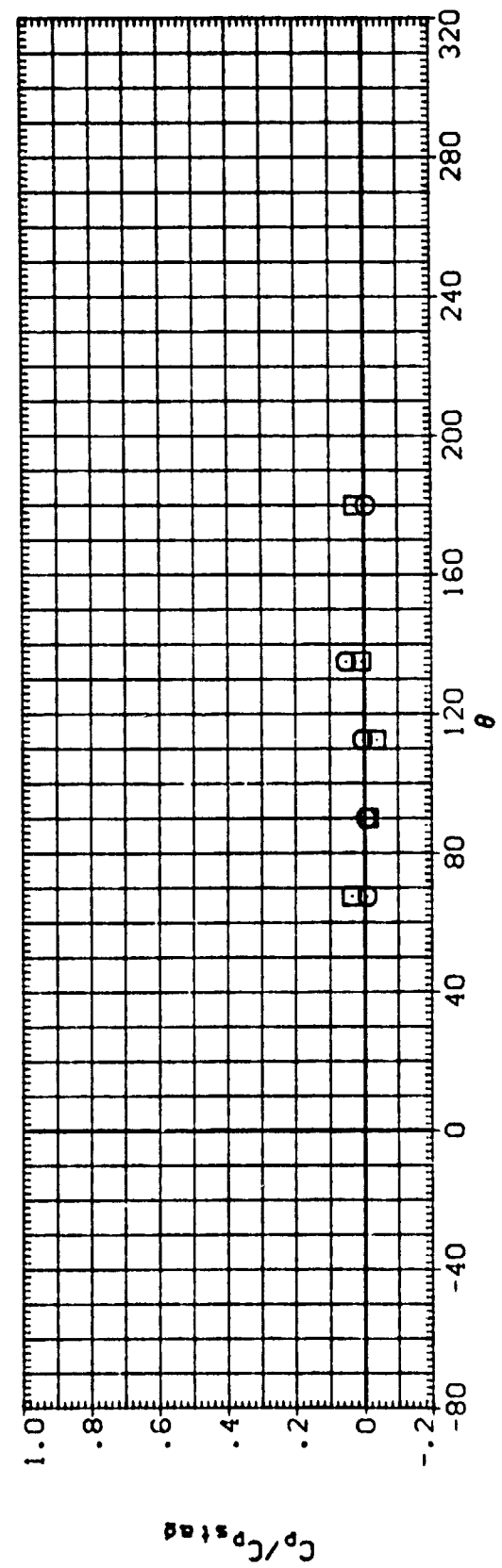
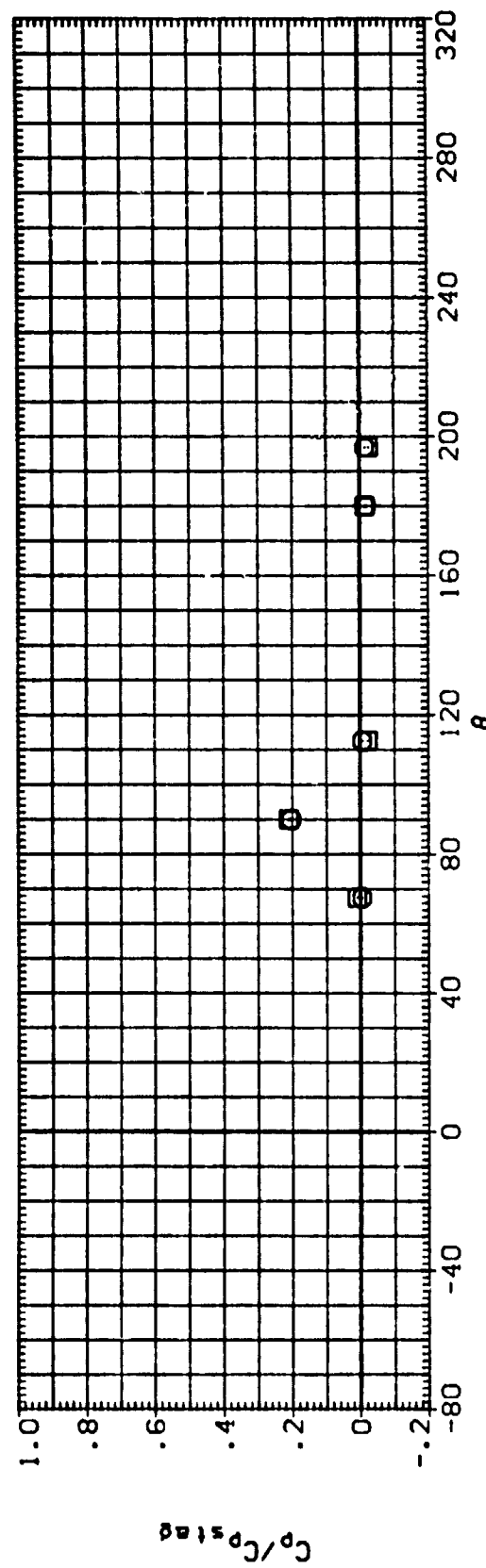


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
RN/L 3.000 BETA .000

MACH 2.950

X/LT .500 .400

ALPHA .000 5.000

SYMBOL 

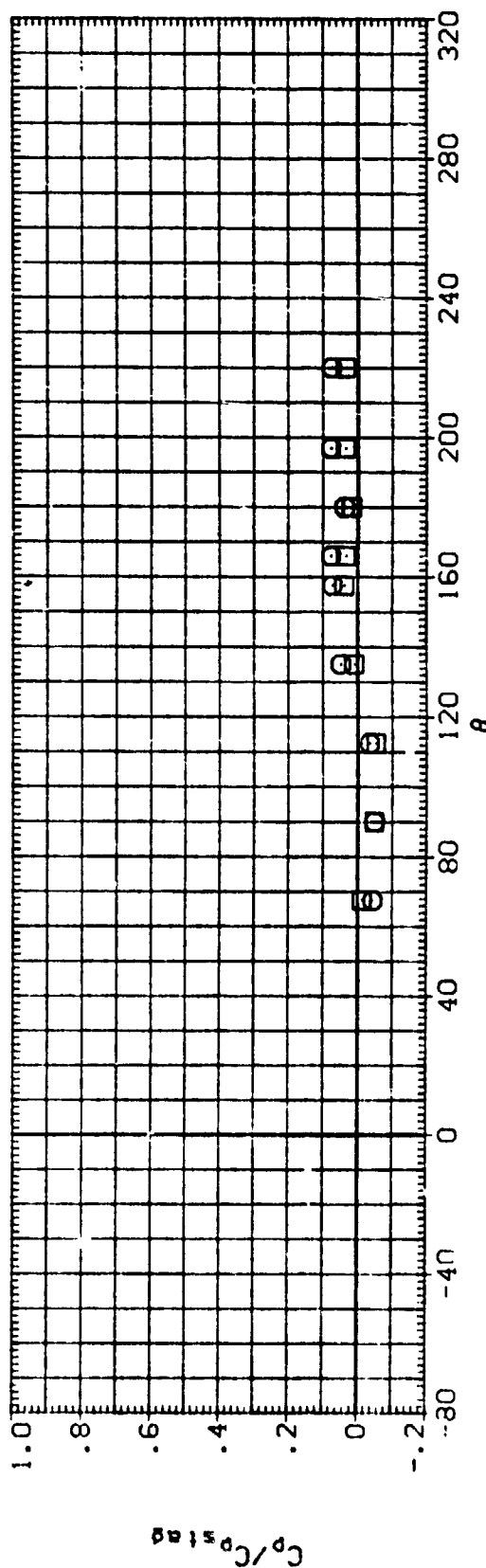
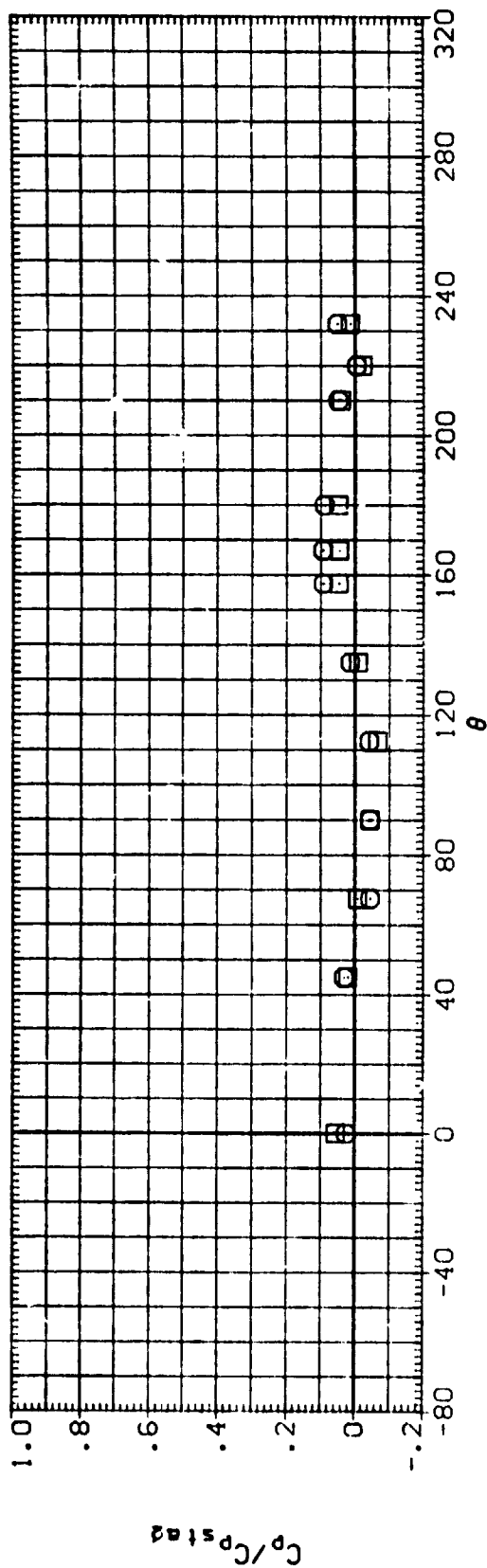


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	.000	.600	2.950		3.000 BETA .000
□	.500	.550			

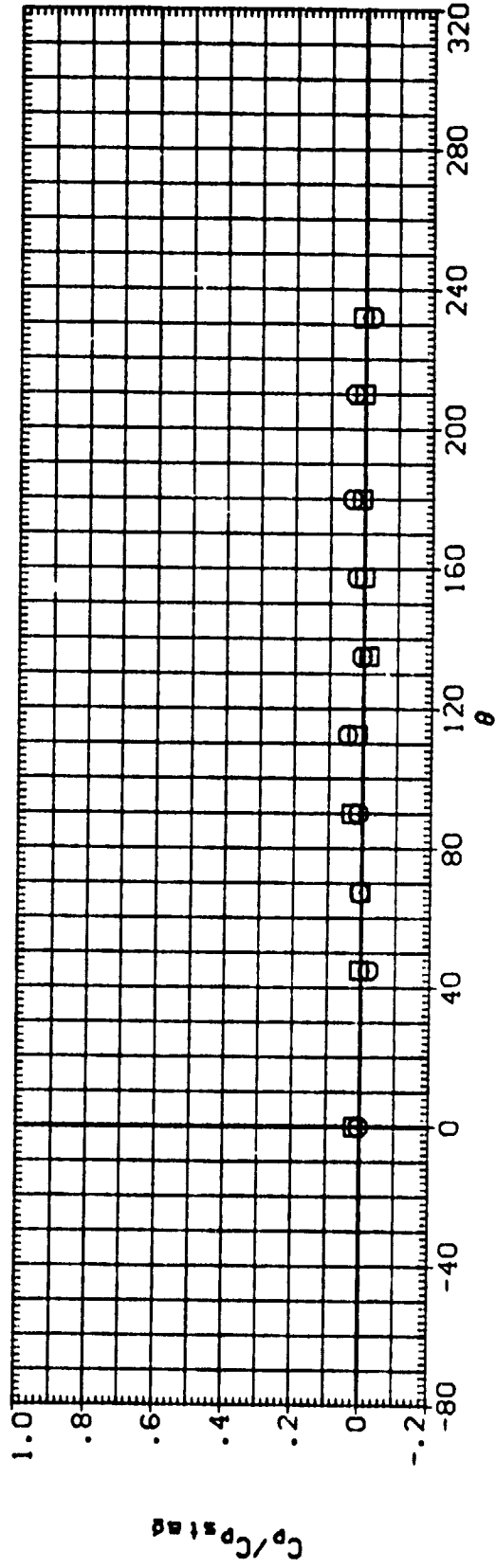
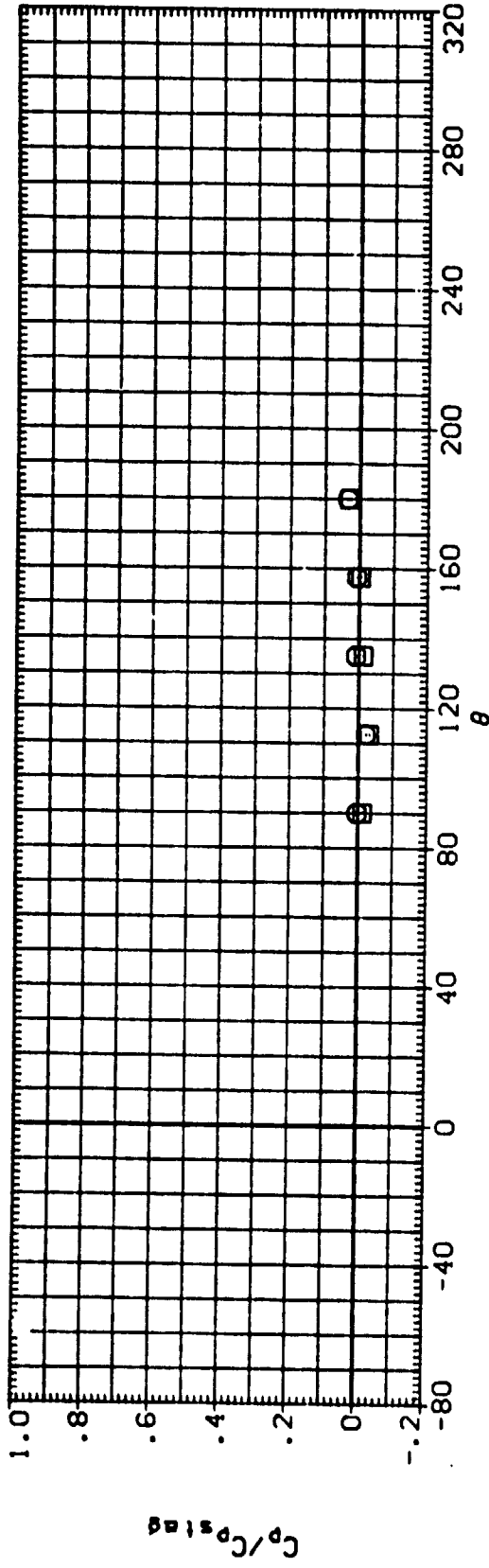


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, BETA= 0. RN/L= 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA .000

MACH 2.950

X/LT .700
ALPHA .000
5.000

□

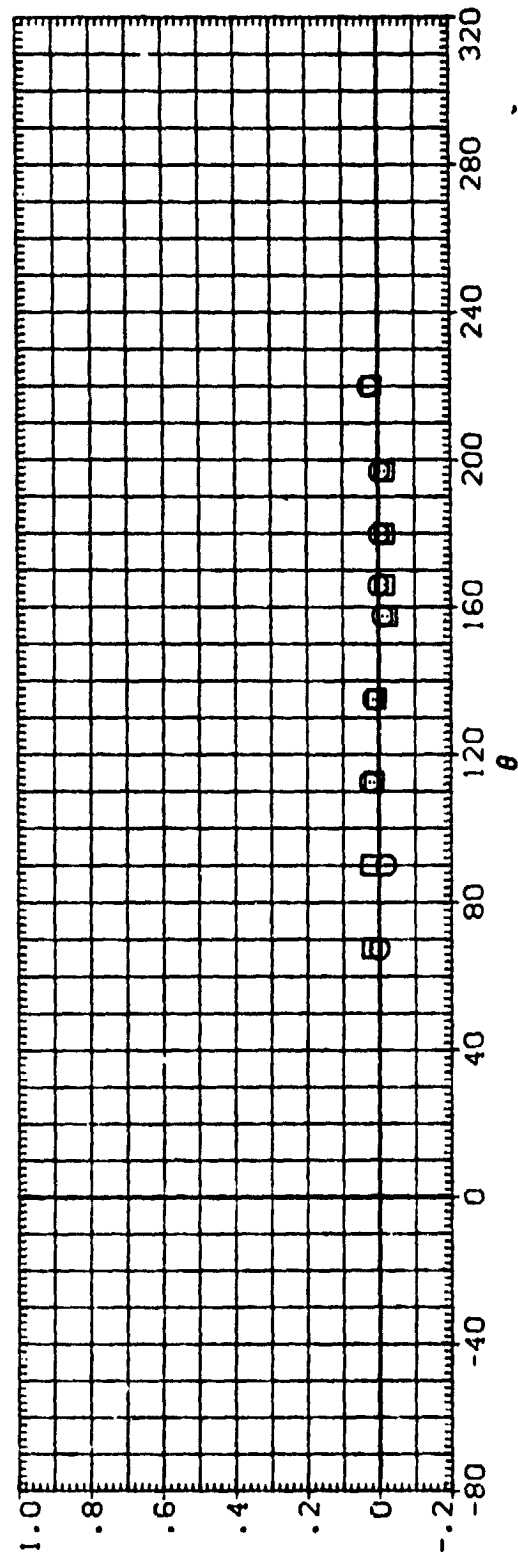
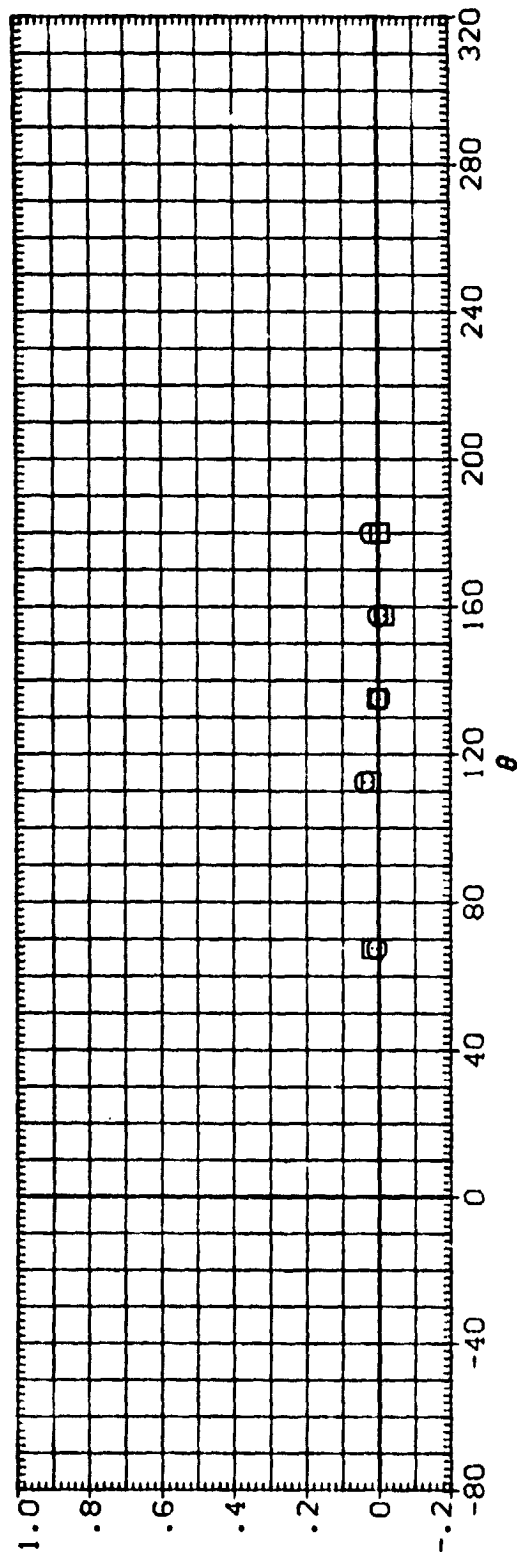


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA .000

RN/L

ALPHA
5.000

X/LT
.800

MACH
2.950

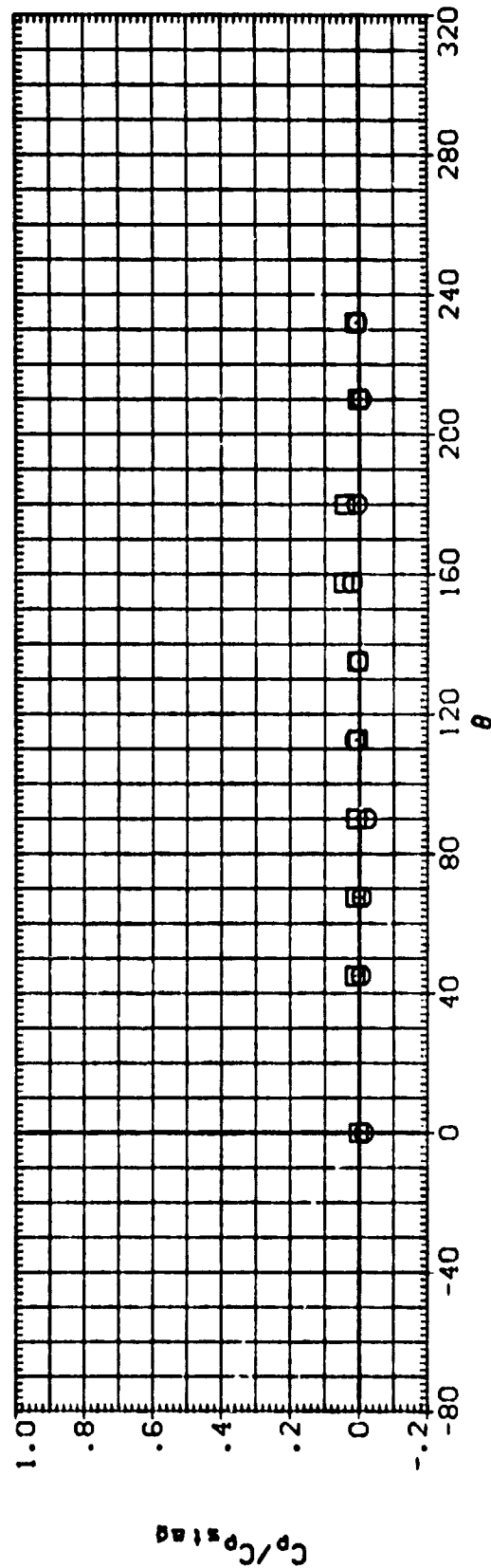
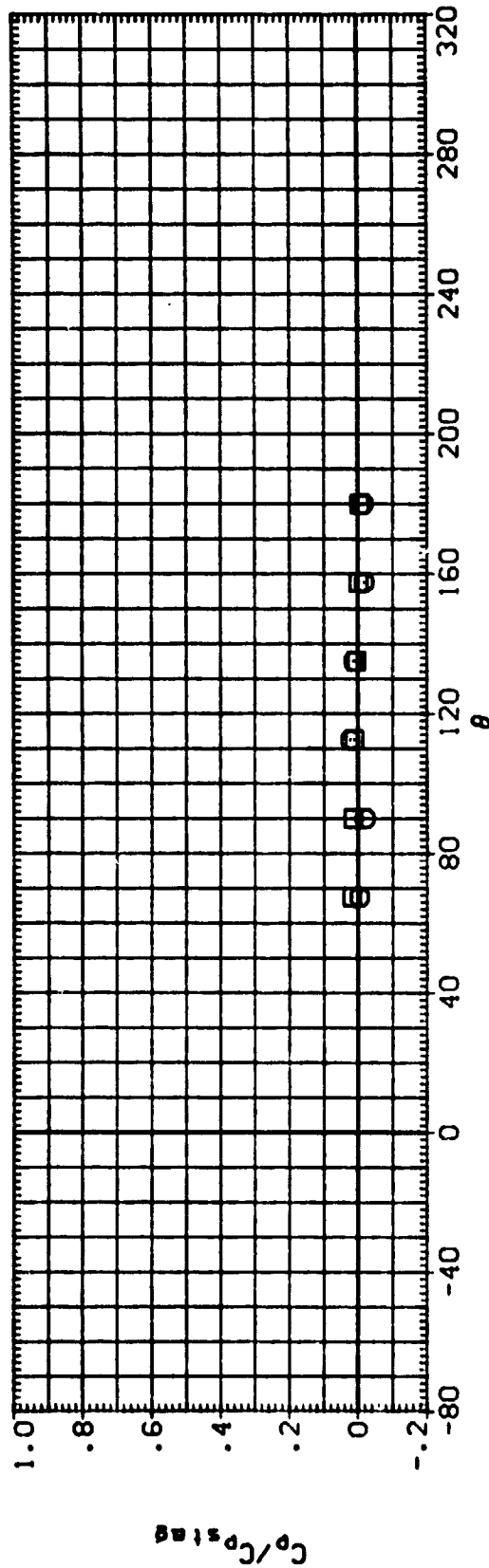


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH

0.000 .900 2.950

5.000 .850

PARAMETRIC VALUES

3.000

BETA

.000

RN/L

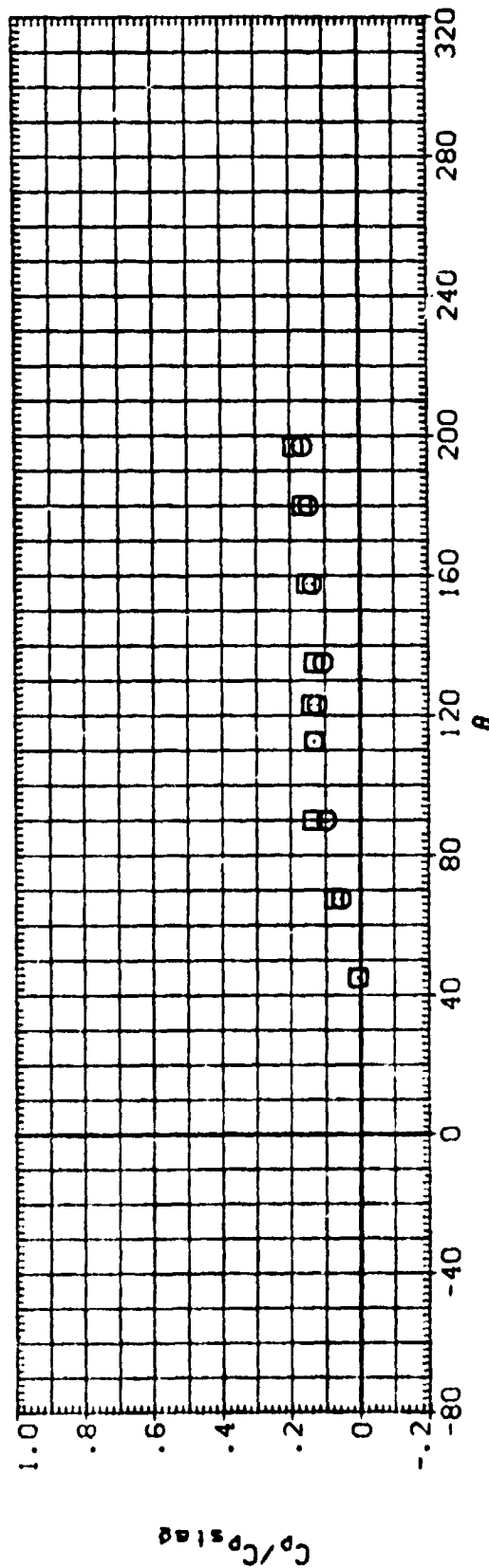
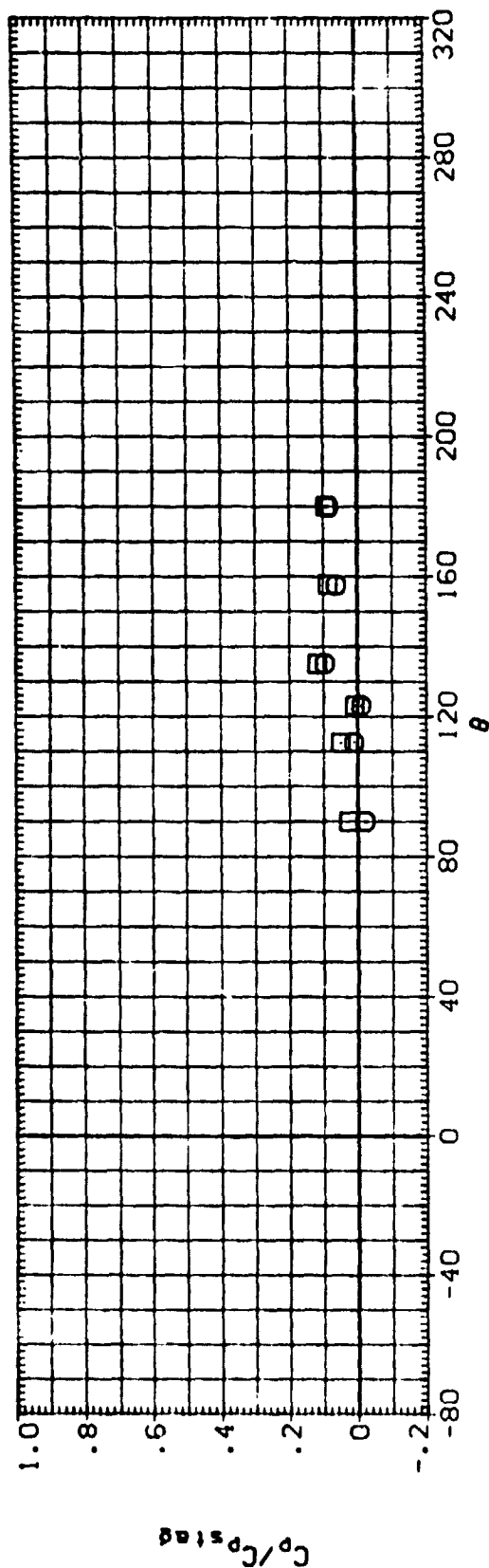


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S&N16 EXTERNAL TANK

SYMBOL ALPHA
 -10.000
 -5.000
 .000
 5.000

X/LT MACH
 .750 3.700
 .300

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

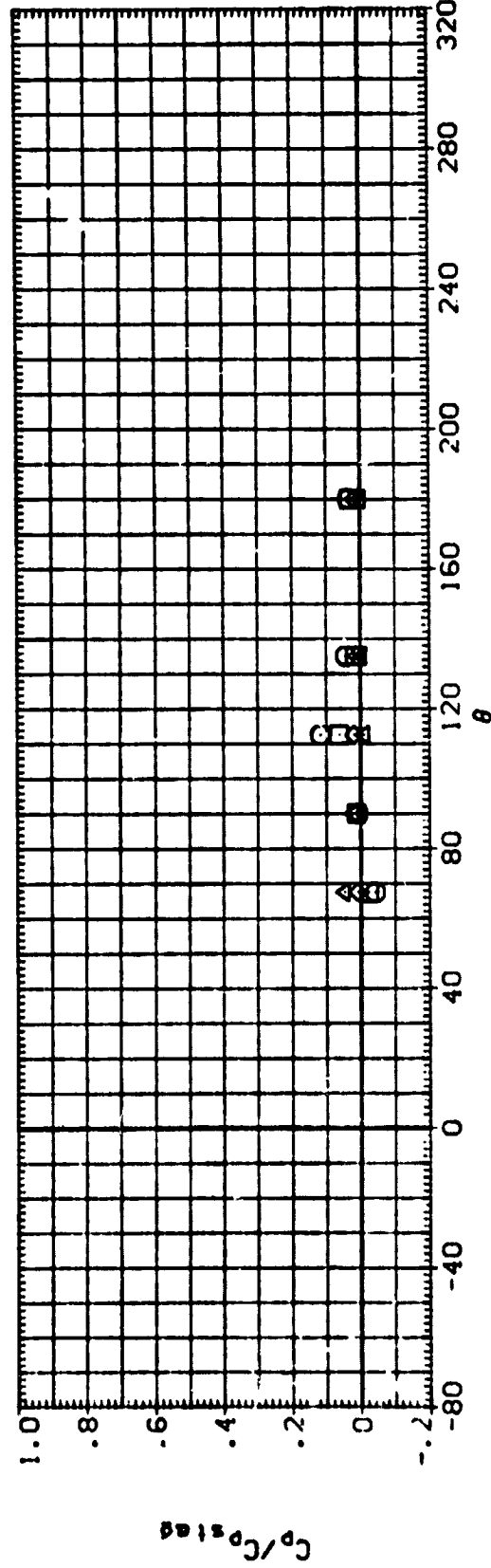
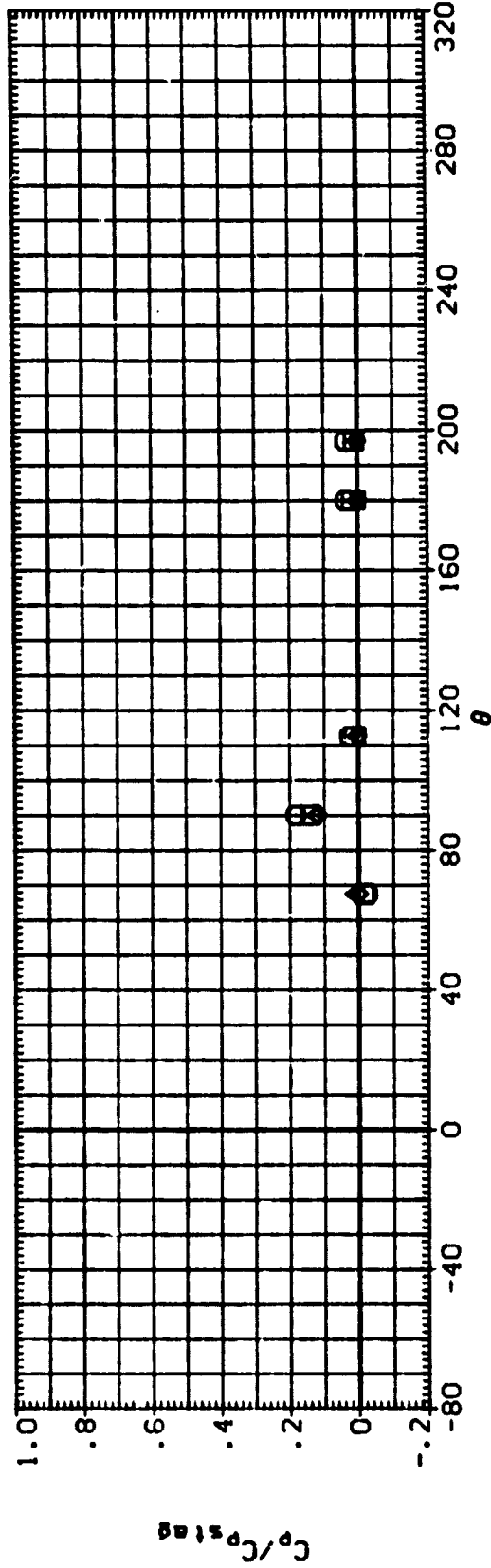


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
 3.000 BETA .000
 RN/L

ALPHA X/L Y MACH
 -10.000 .500 3.700
 -5.000 .400
 .000
 5.000

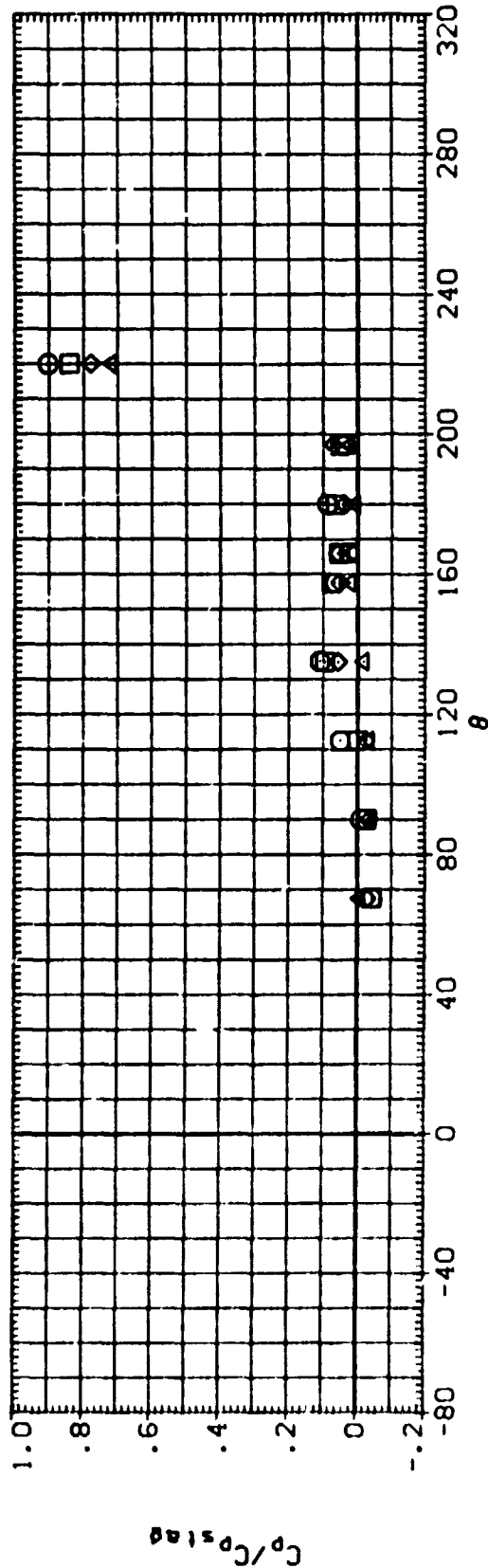
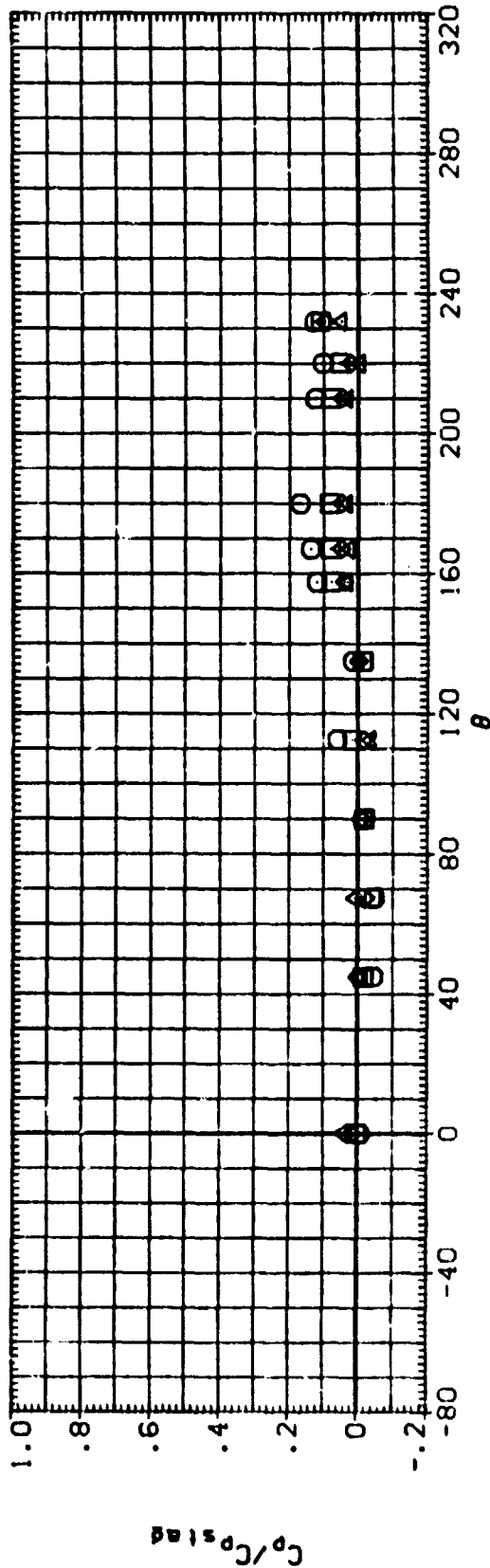


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -10.000
 -5.000
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA .000

RN/L

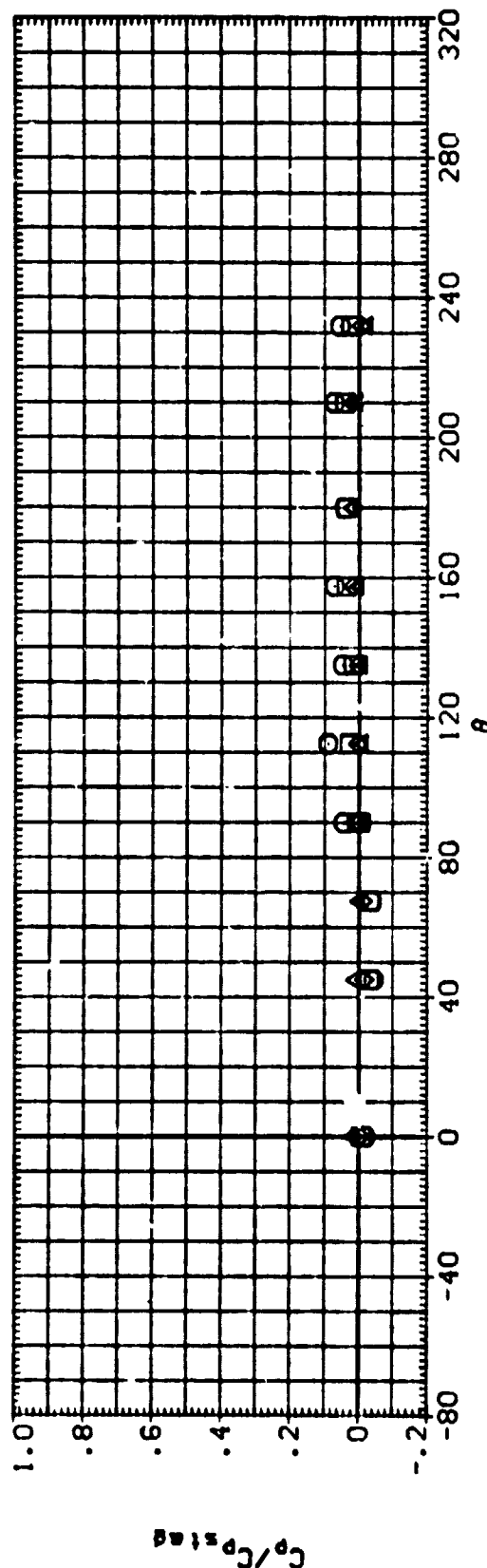
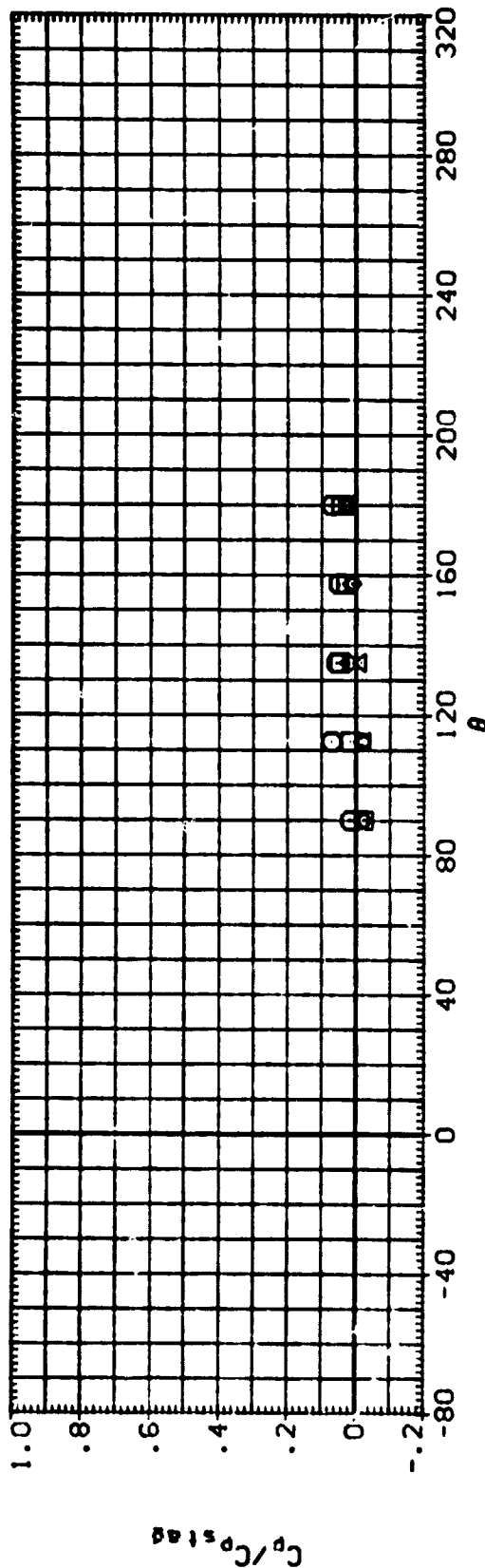


FIG. 20 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 3.0

(R03TAB) UPVT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK
 SYMBOL ALPHA X/L T MACH
 -10.000 .700 3.700
 -5.000 .650
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

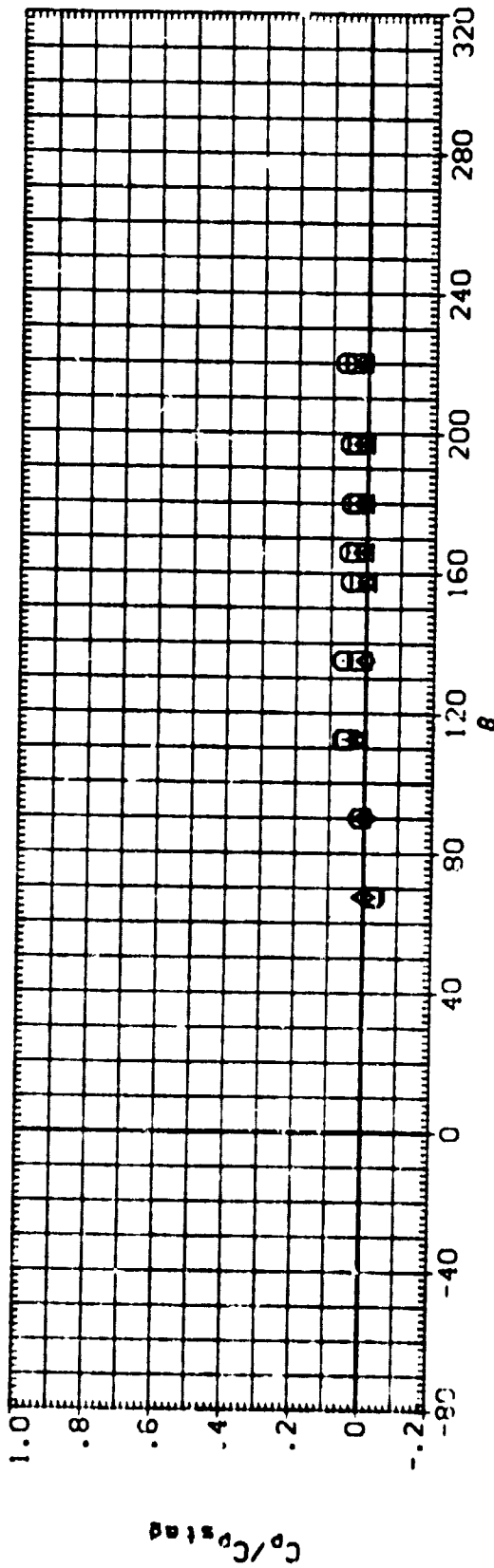
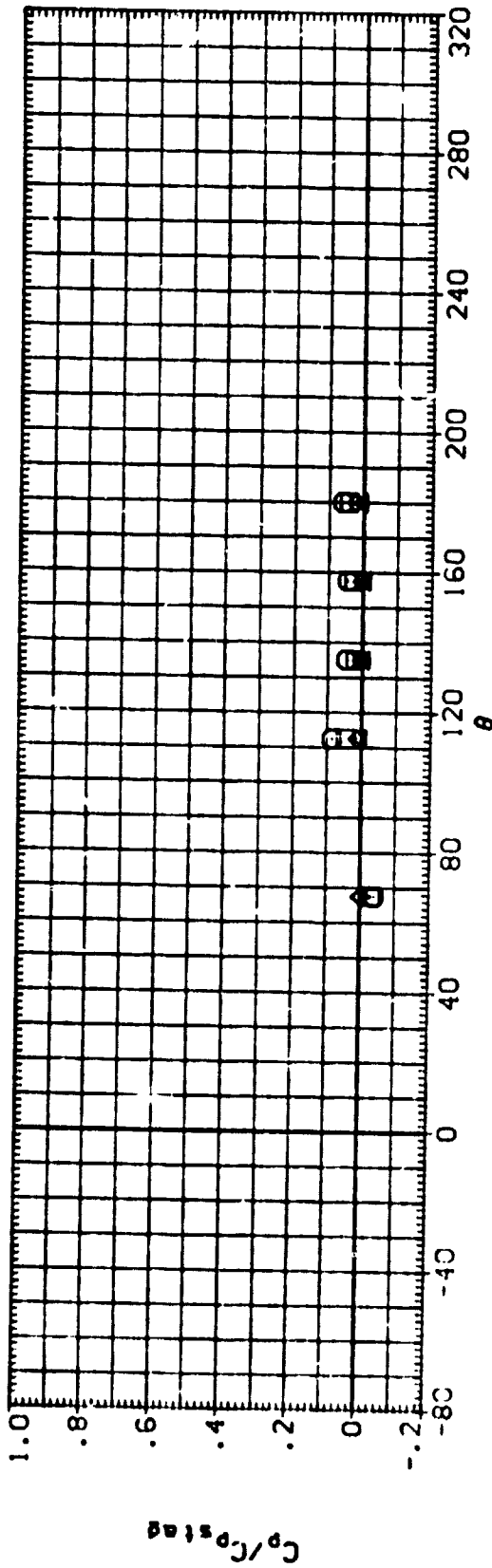


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(RQ3TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH 3.700

X/LT .800 .750

ALPHA
-10.000
-5.000
0.000
5.000

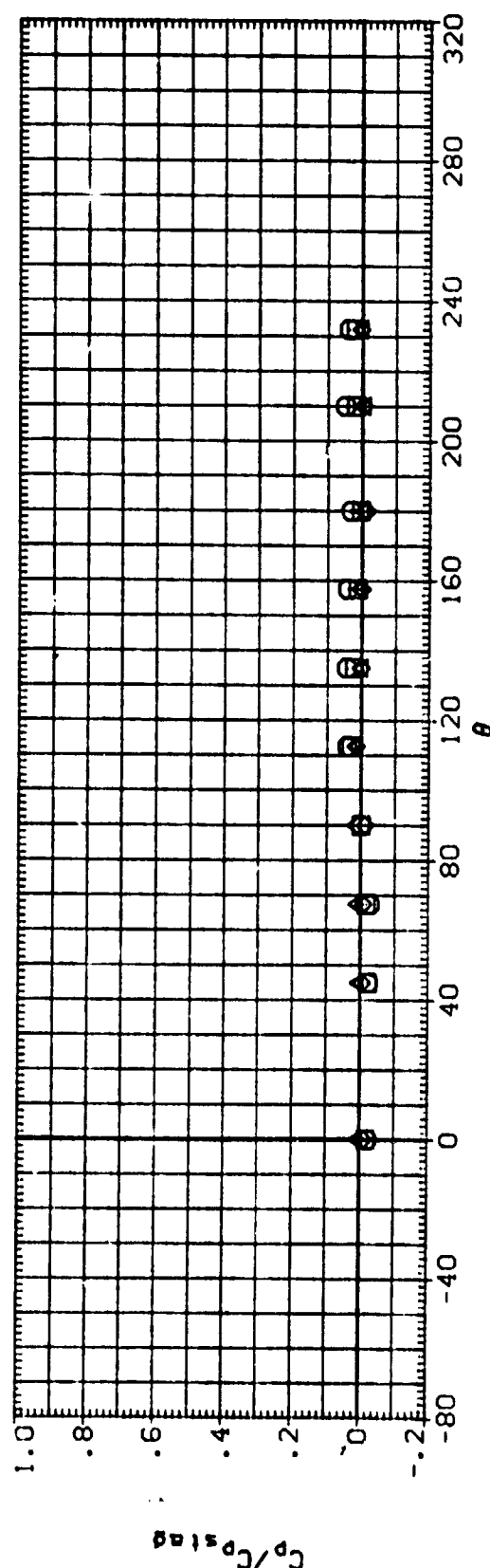
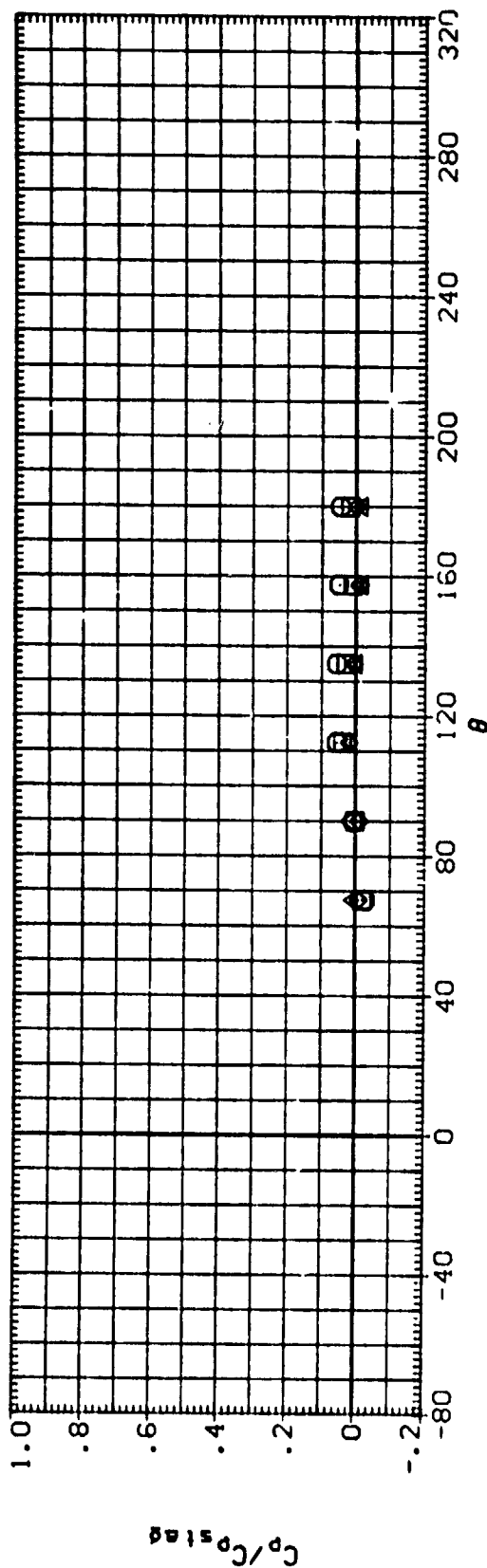


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	-10.000	.900	3.700		3.000 BETA .000
□	-5.000	.850			
□	.000				
□	5.000				

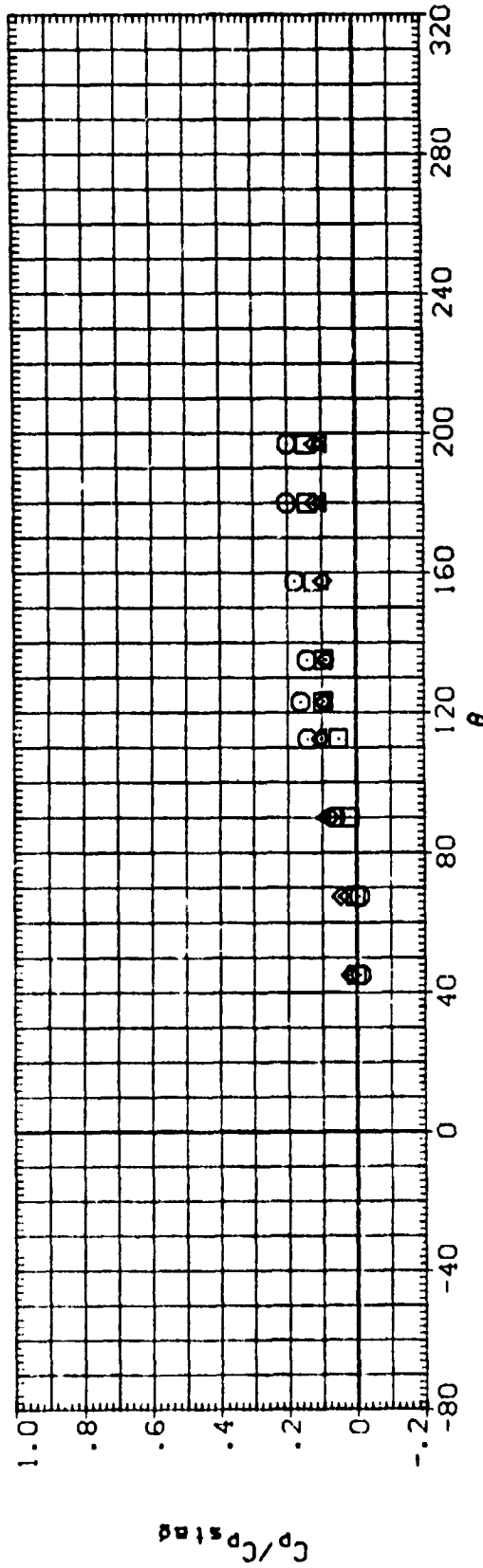
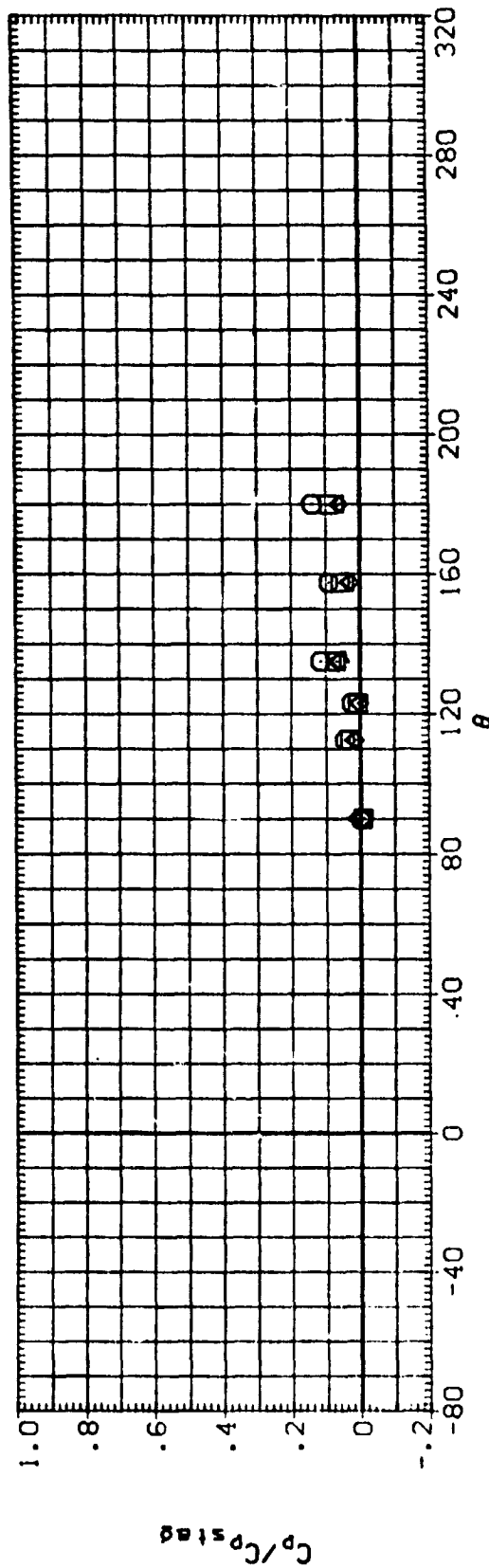


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	-10.000	.350	4.600		3.000 BETA .000
□	-5.000	.300			
□	.000				
□	5.000				

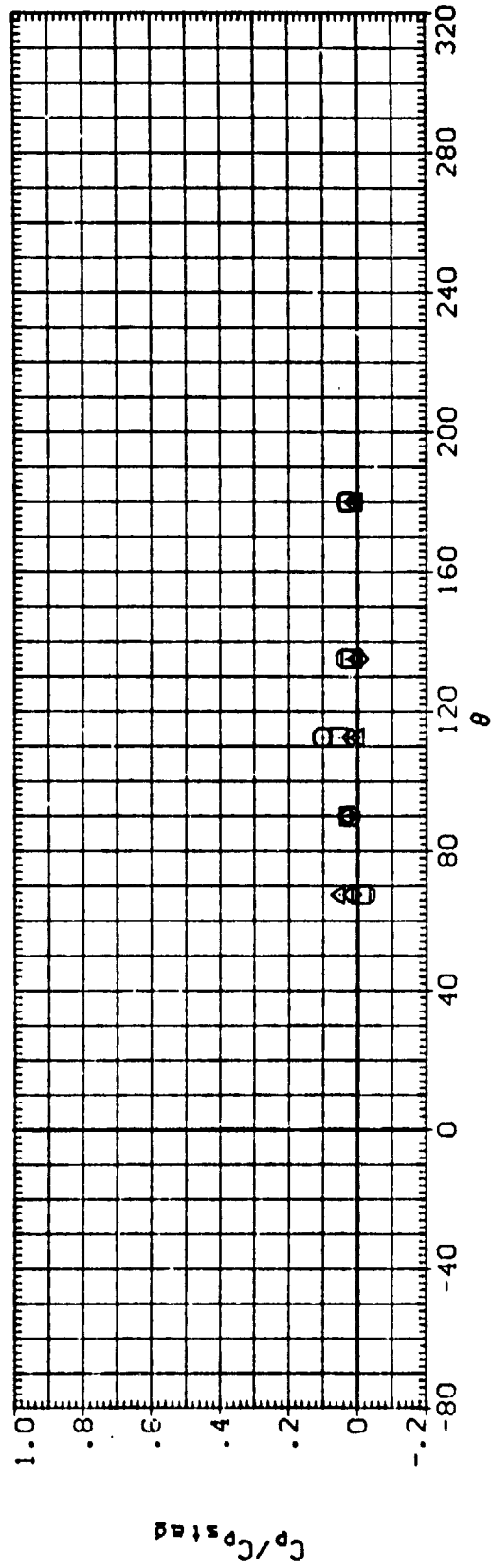
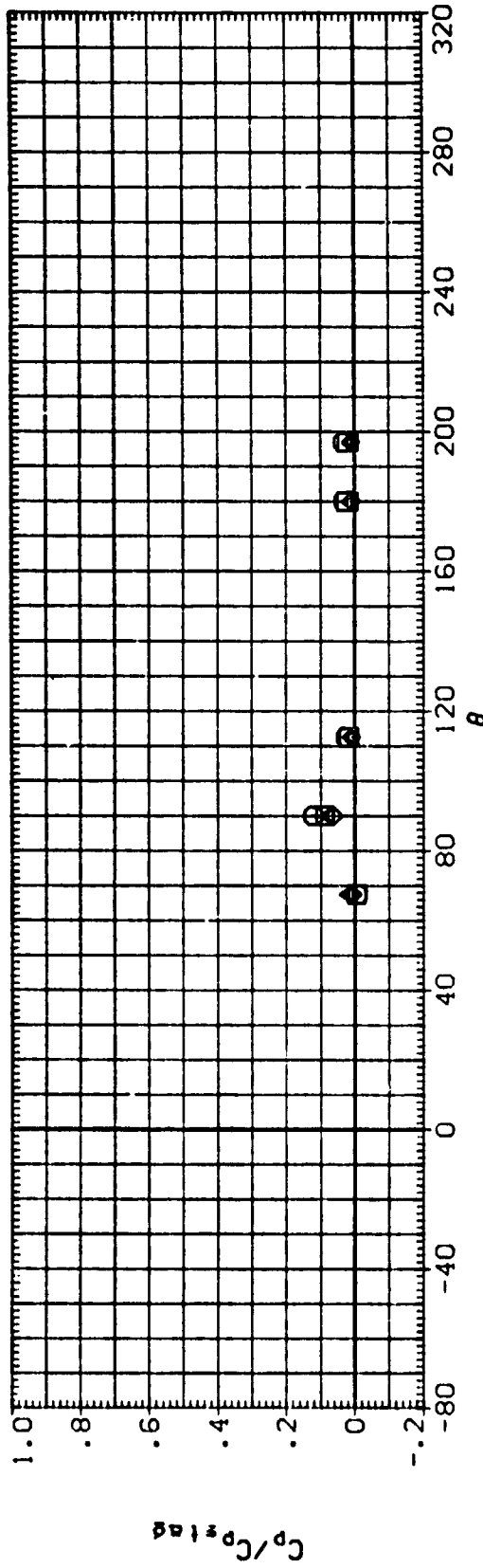


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK, BETA= 0. RN/L= 3.0

SYMBOL ALPHA X/LT MACH

-10.000 .500 4.600
-5.000 .400
.000
5.000

PARAMETRIC VALUES
RN/L 3.000 BETA .000

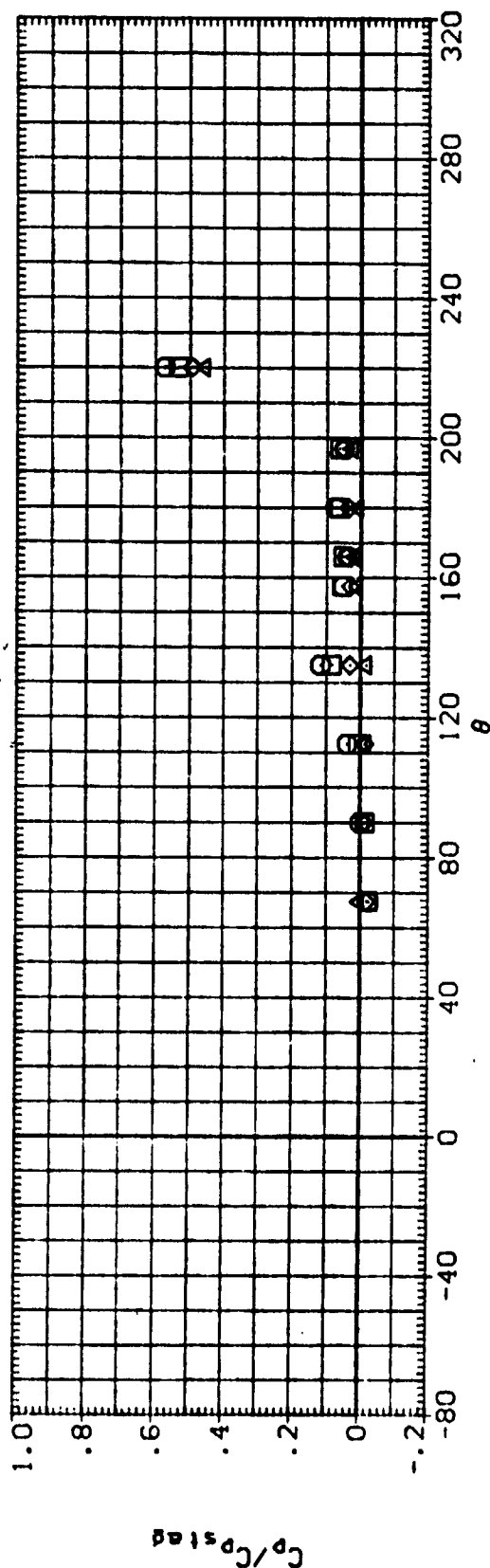
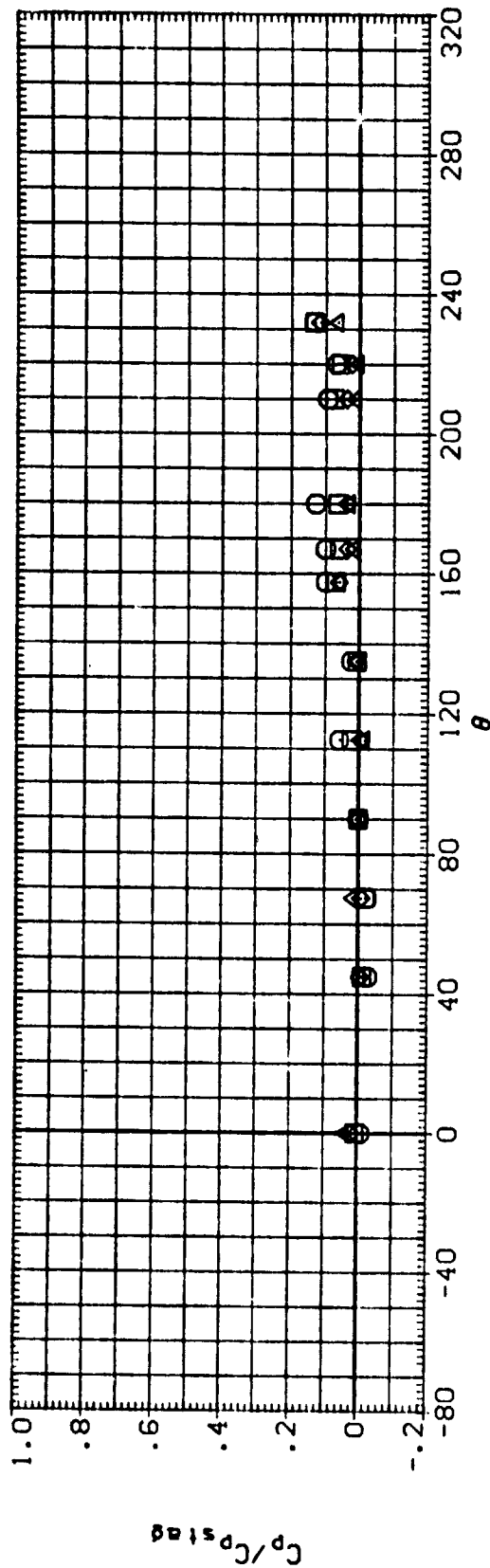


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -10.000 .600 4.600
 -5.000 .550
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA .000

RN/L

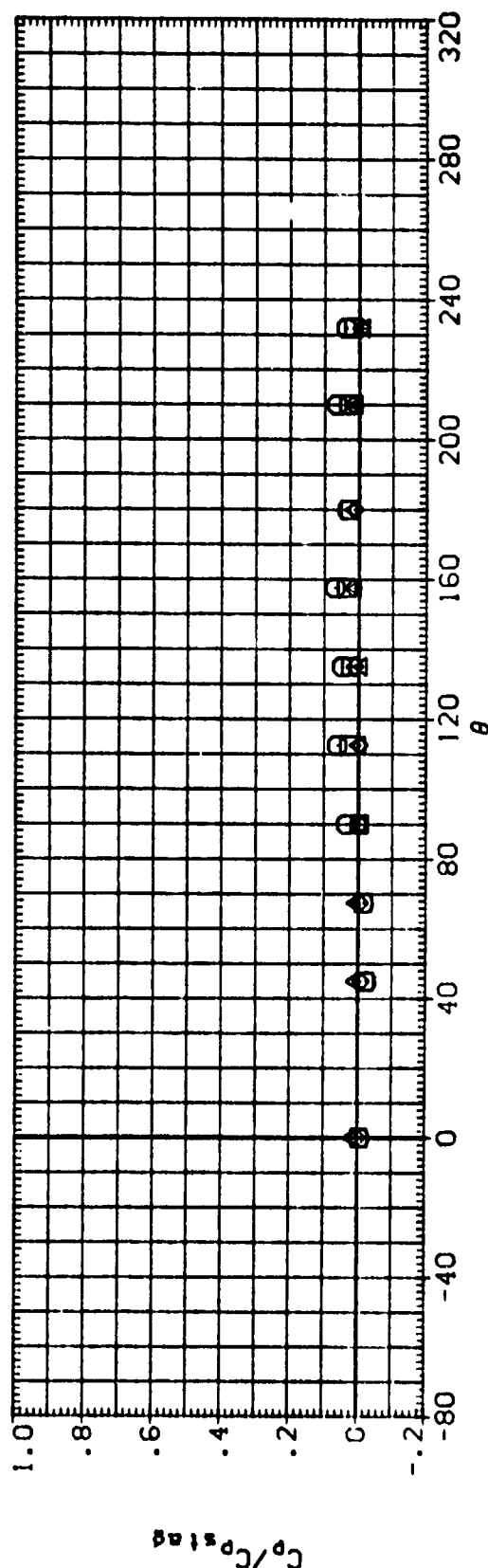
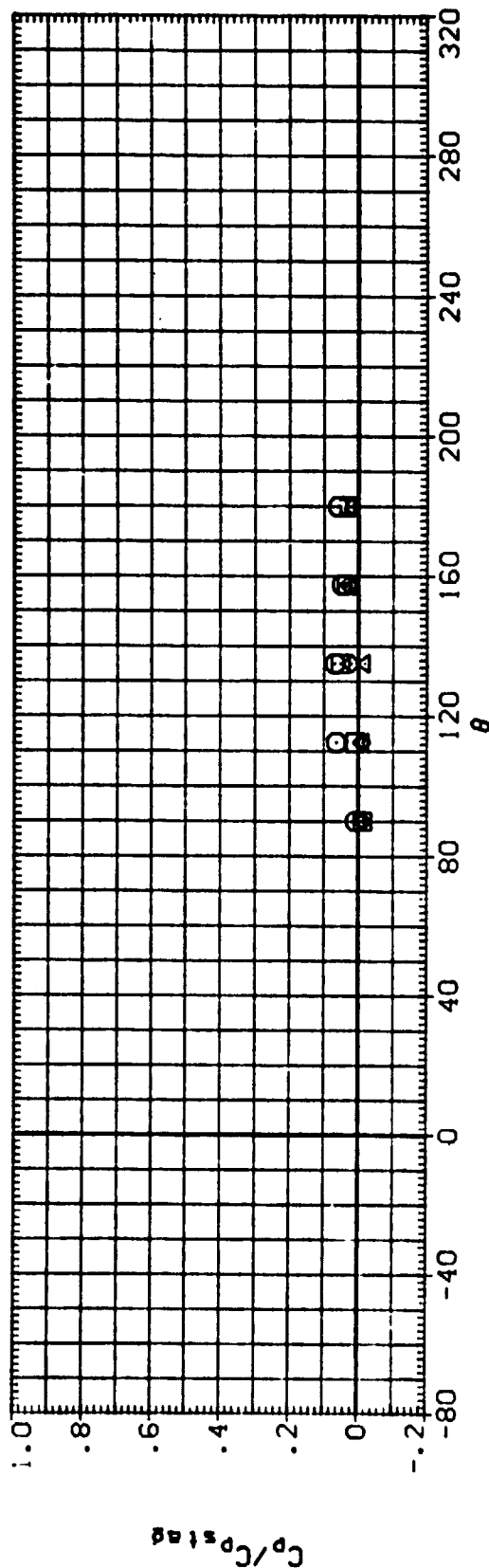


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/L T MACH
□ -10.000 .700 4.600
□ -5.000 .650
□ 5.000

PARAMETRIC VALUES
3.000 BETA .000

RN/L

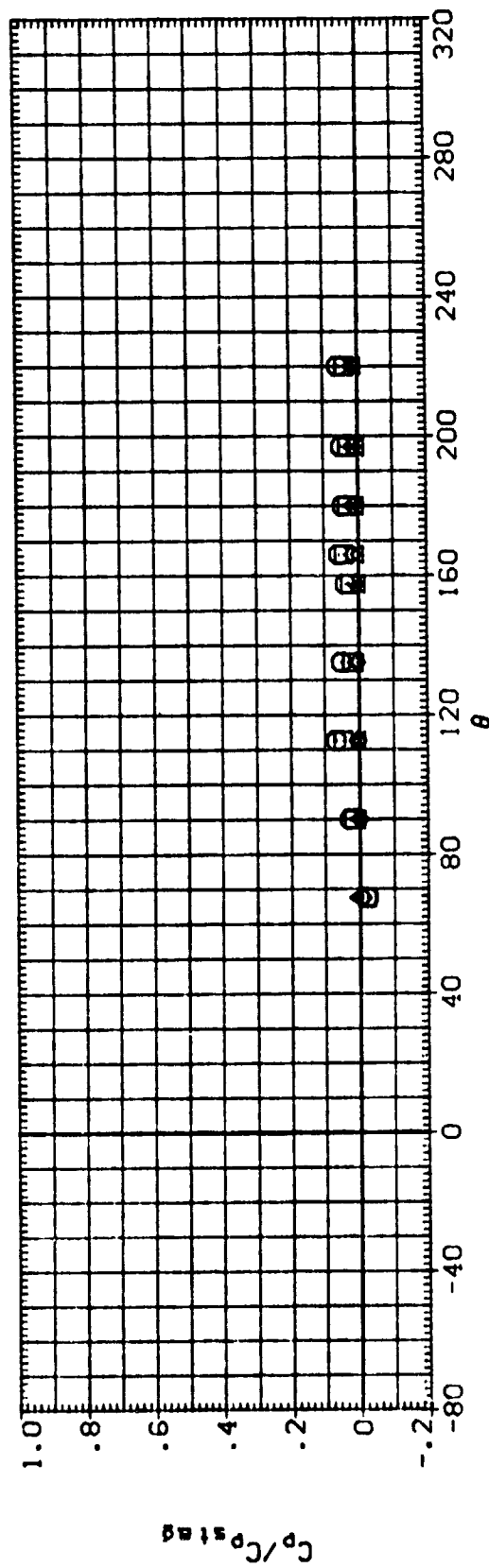
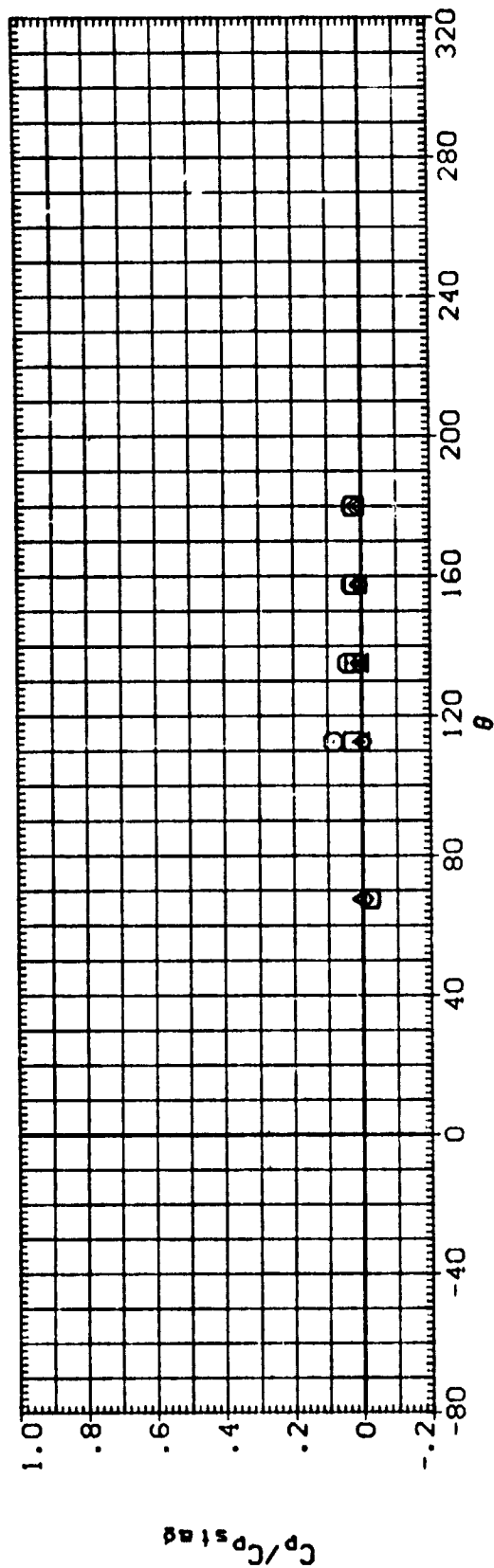


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
	-10.000	.800	4.600		3.000 BETA .000
	-5.000	.750			
	.000				
	5.000				

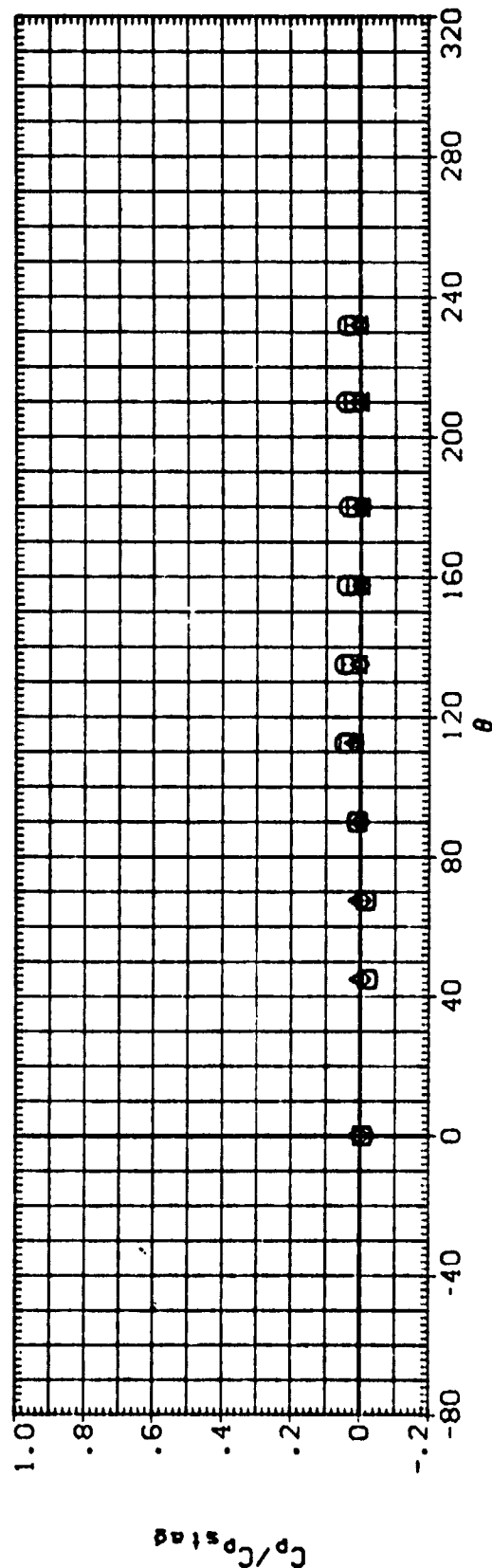
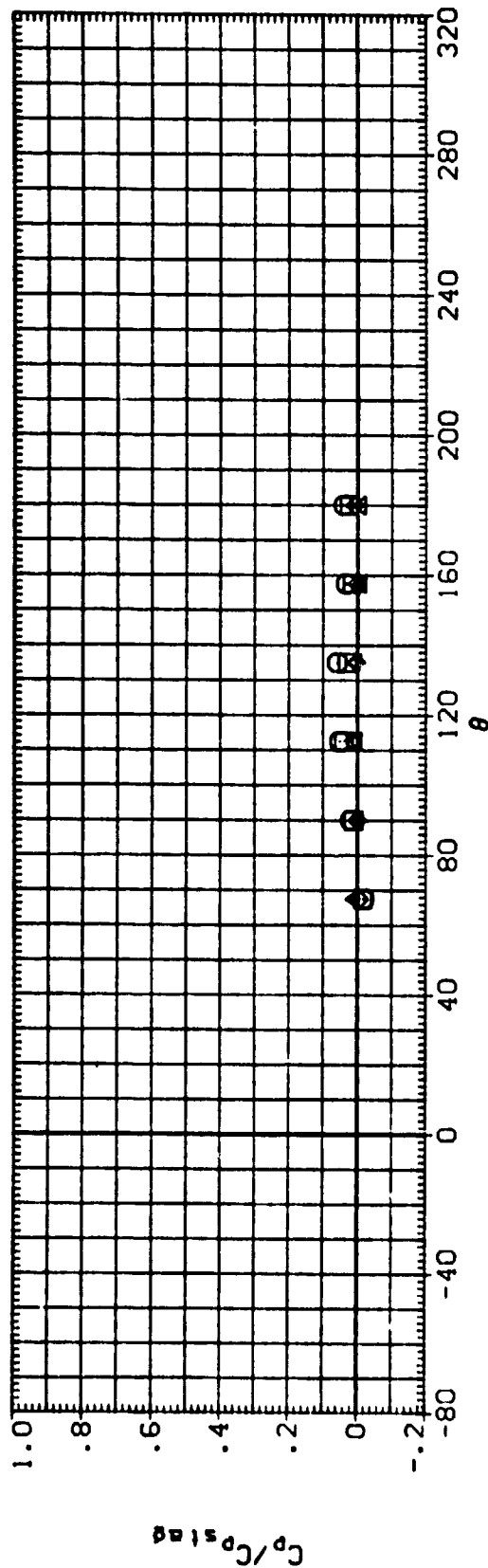


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TAB) UPWT 1059 (IH₄ 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/L T MACH
 -10.000 .900 4.600
 -5.000 .950
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA .000
 RN/L

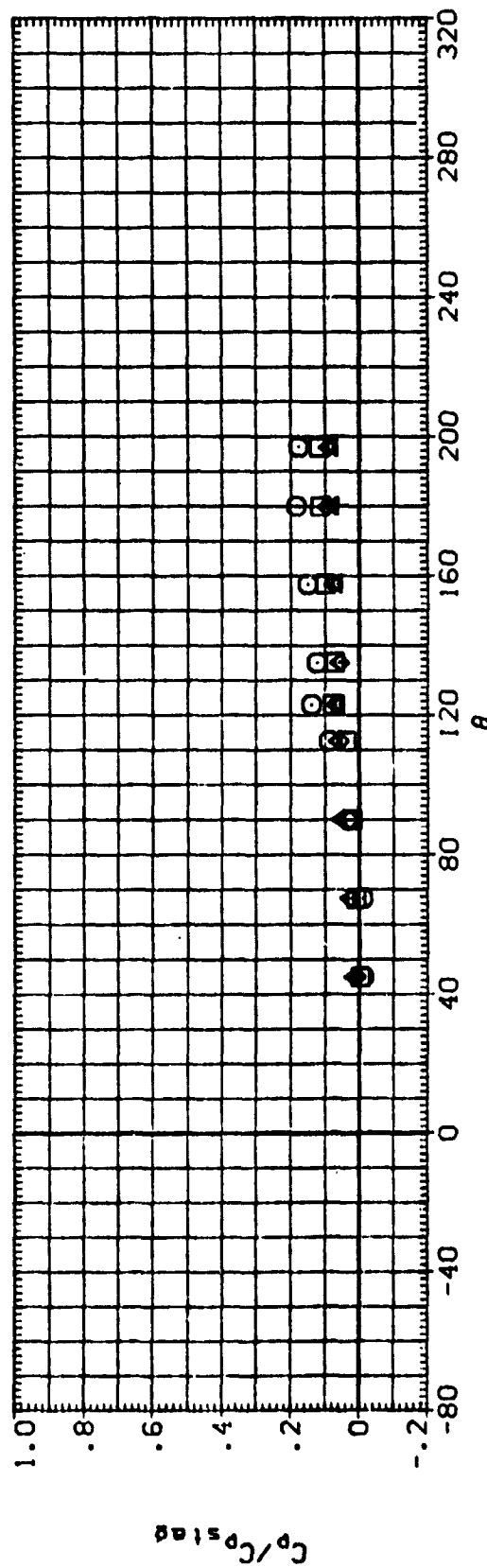
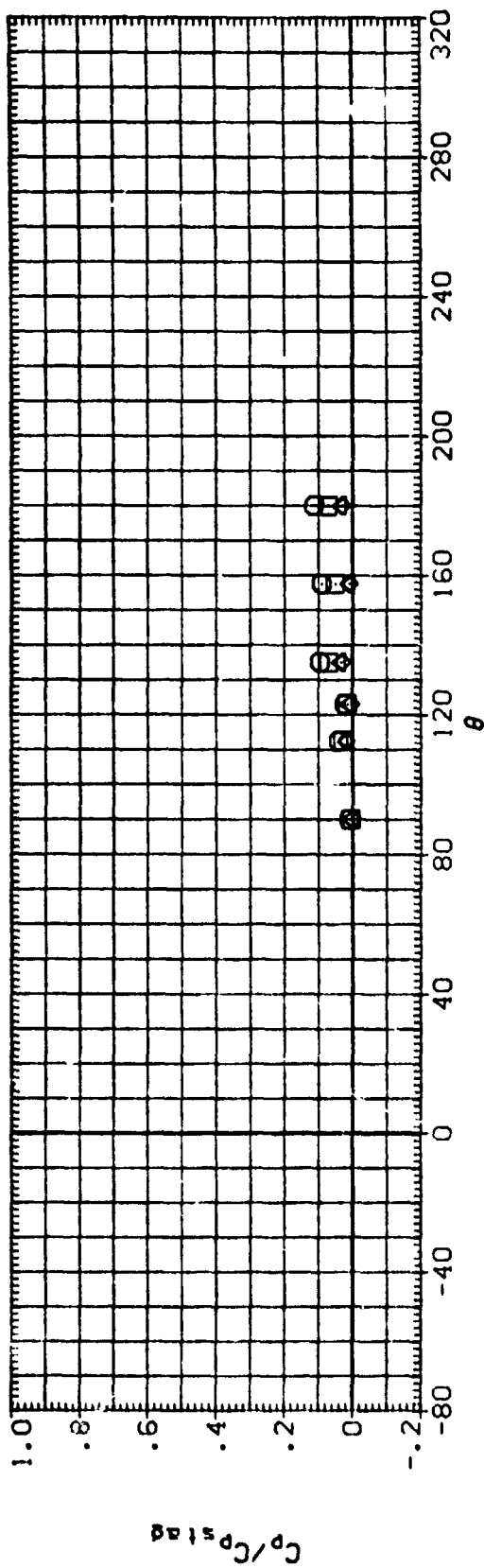


FIG. 20 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	PSI	MACH	RM/L	PARAMETRIC VALUES
□	.000	180.000	2.360	3.000	BETA .000
	5.000	90.000			

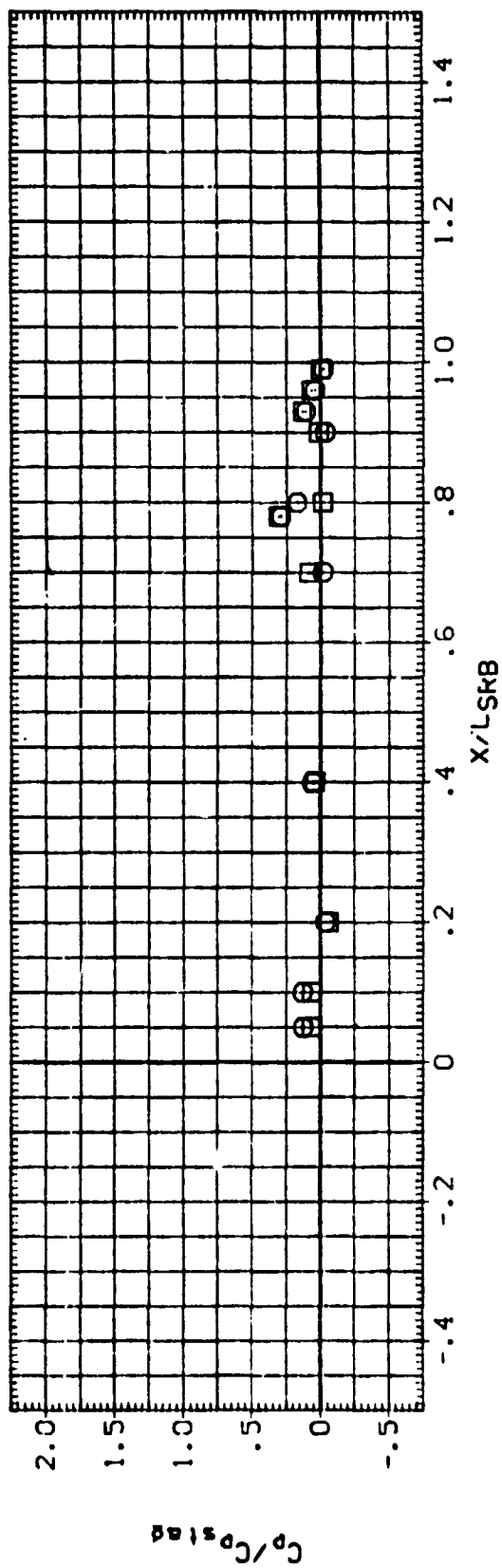
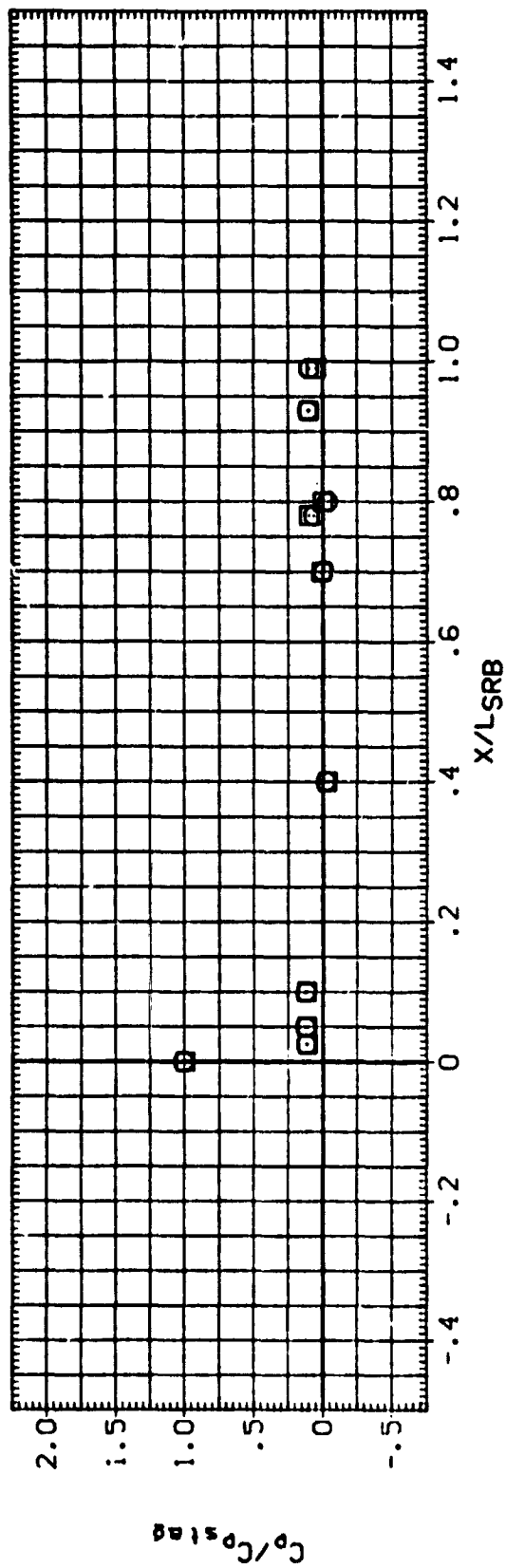


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 0.000 225.000 2.360
 5.000 210.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

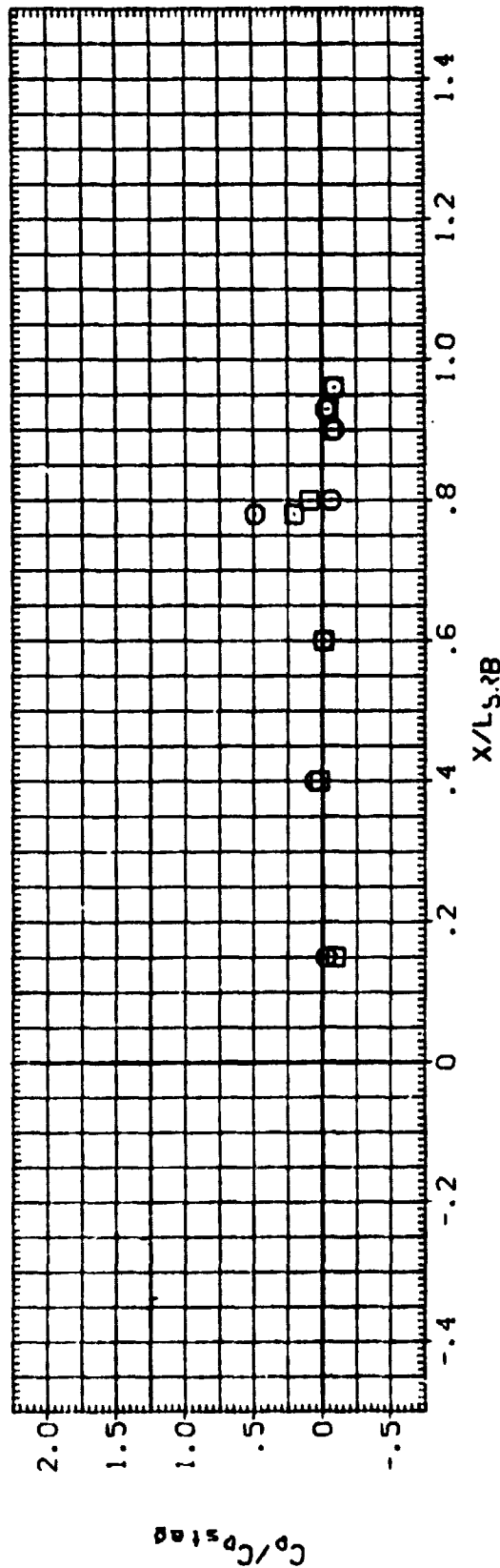
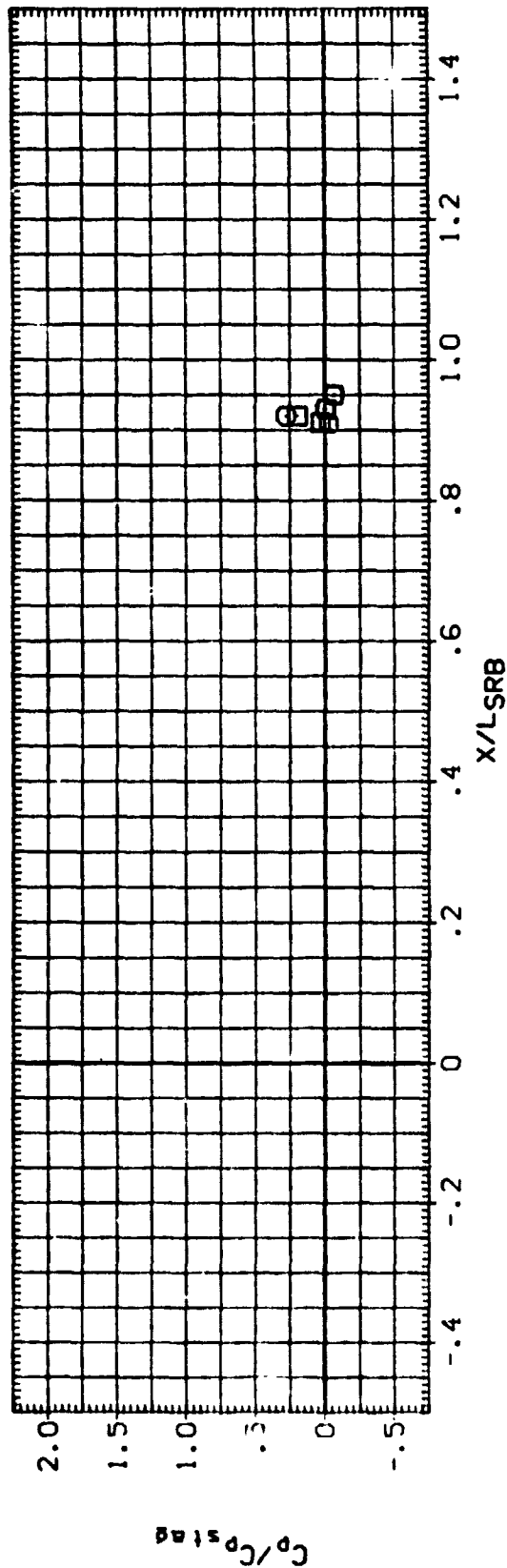


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 5.000 270.000 2.360
 3.000 247.500

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

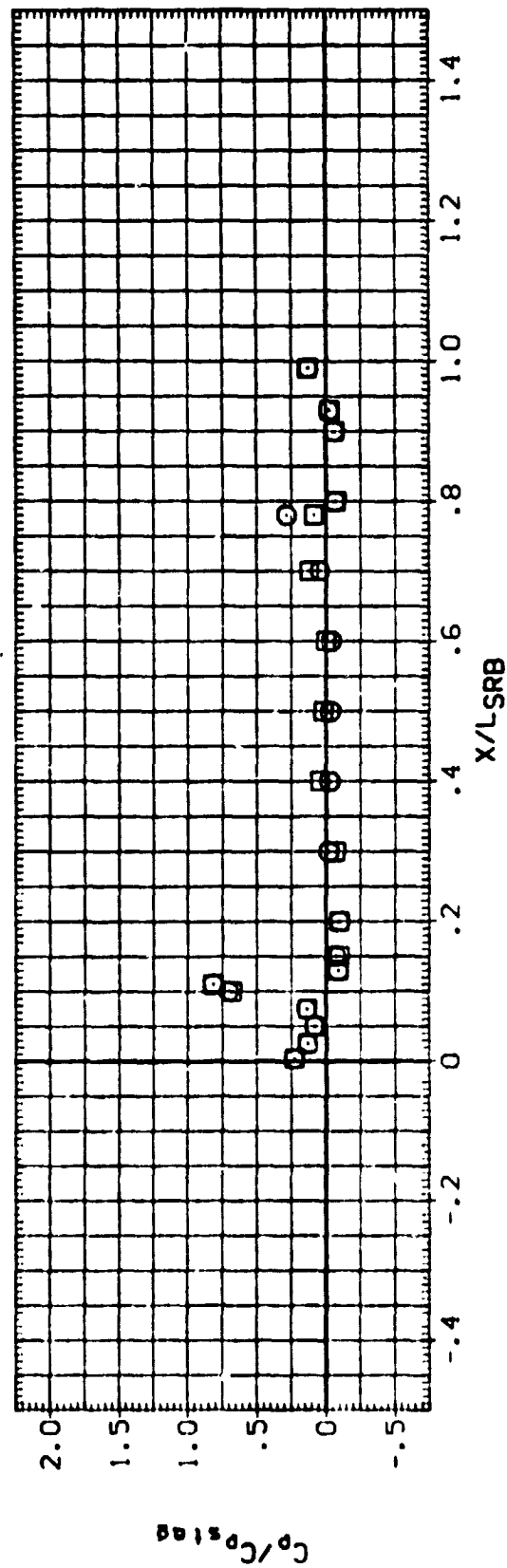
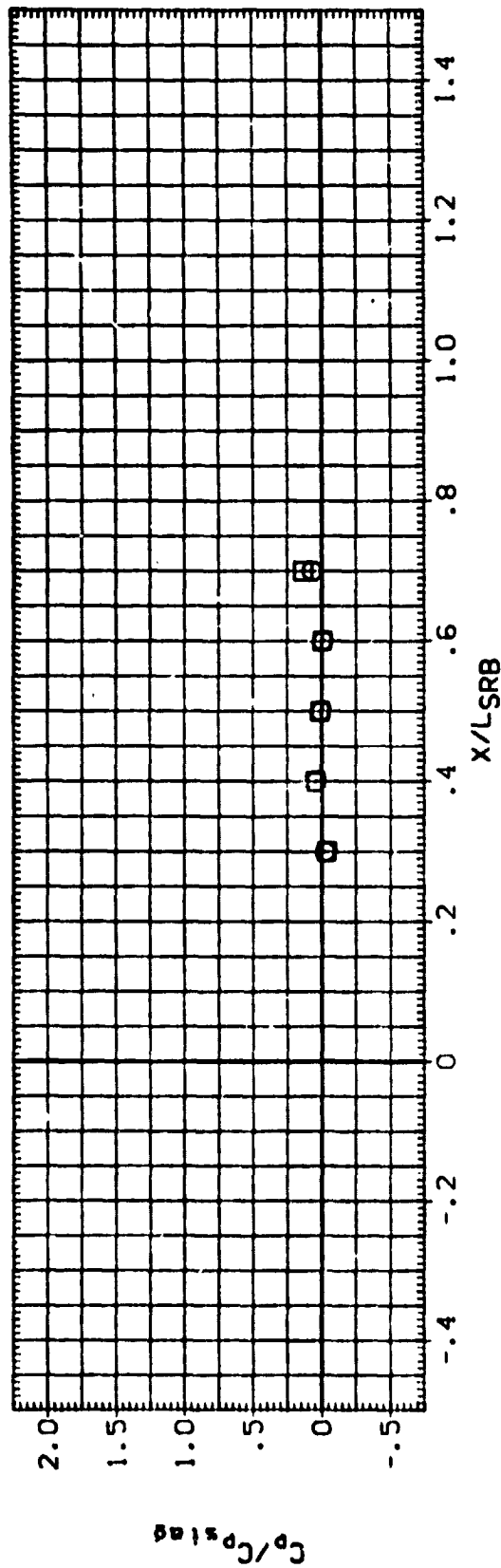


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(P03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
□ .000 180.000 2.950
5.000 50.000

PARAMETRIC VALUES
3.000 BETA .000

RN/L

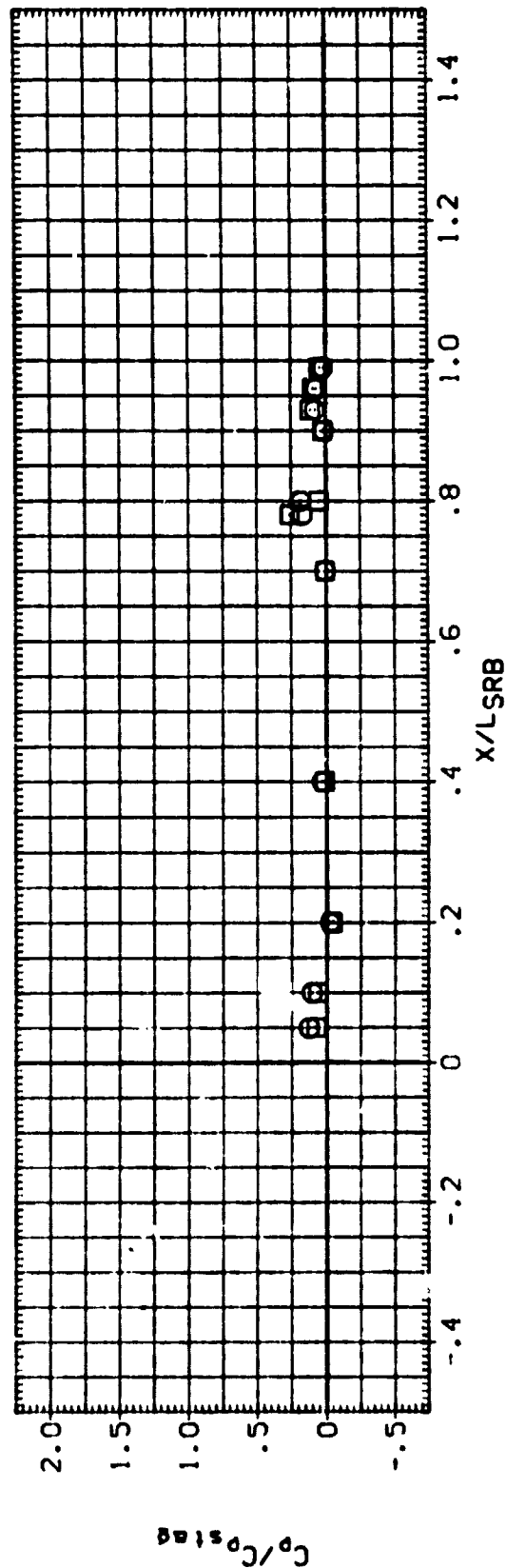
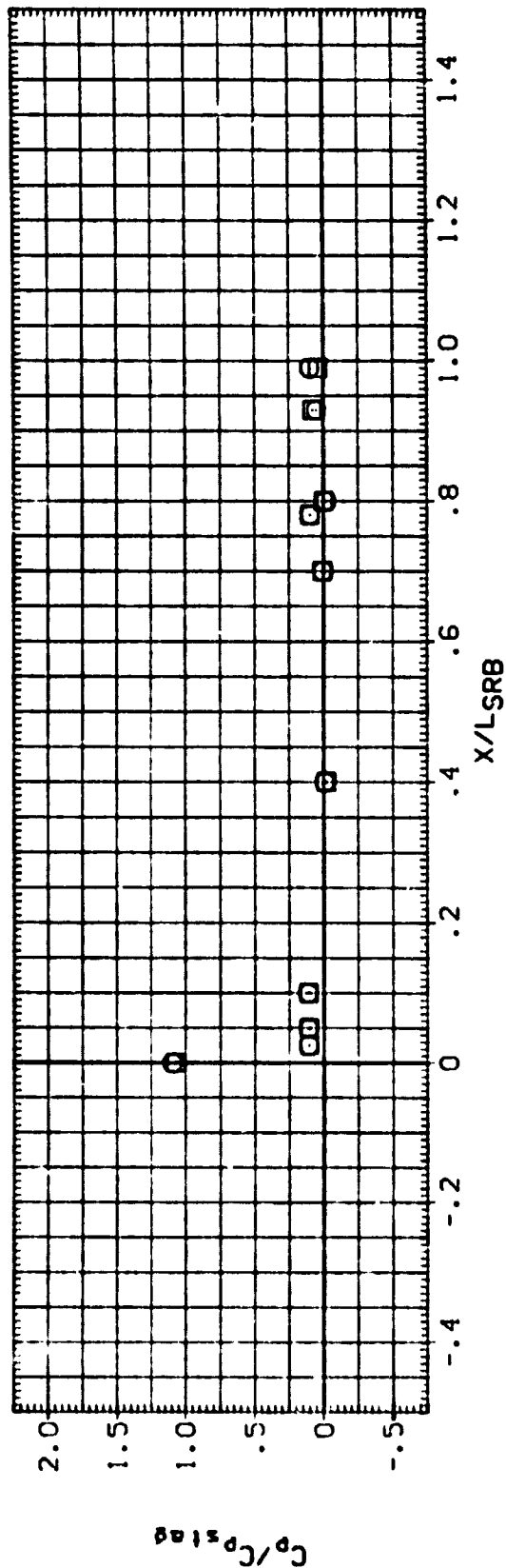


FIG. 21 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 5.000 225.000 2.950

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

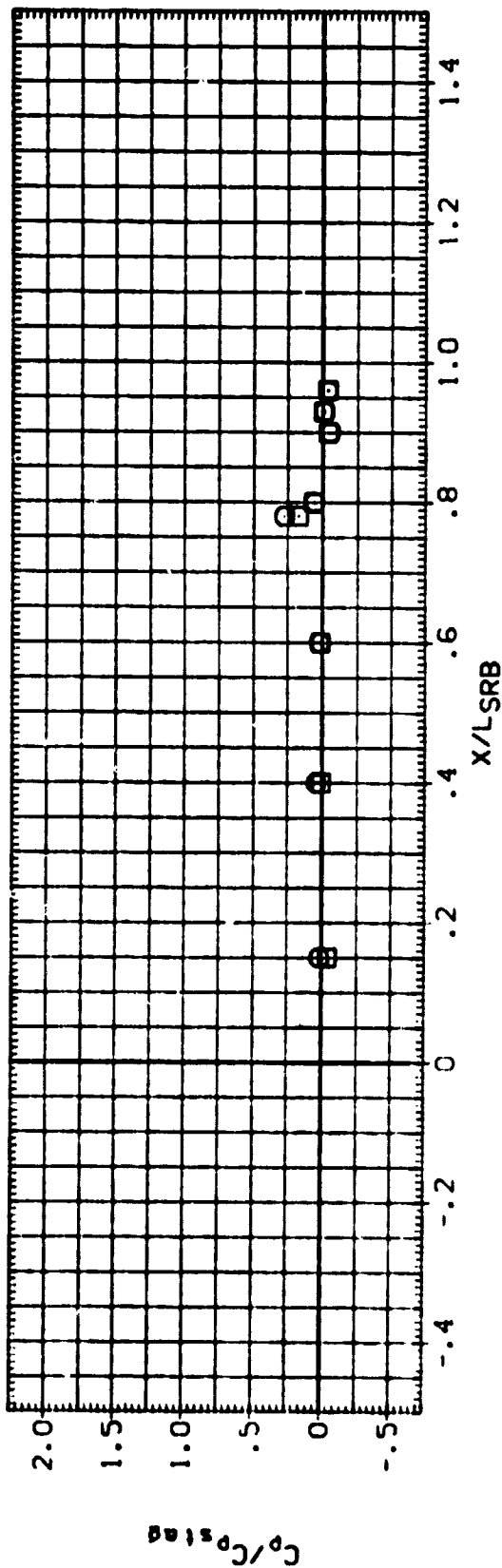
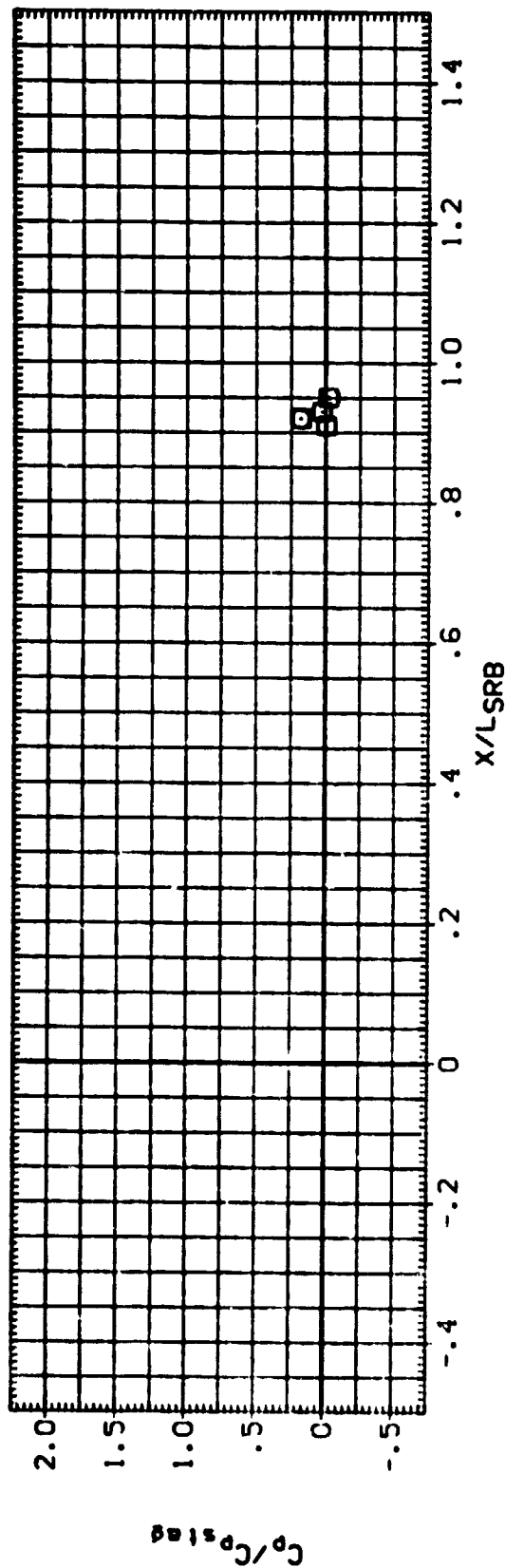


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 0 .003 270.000 2.950
 5.000 247.500

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

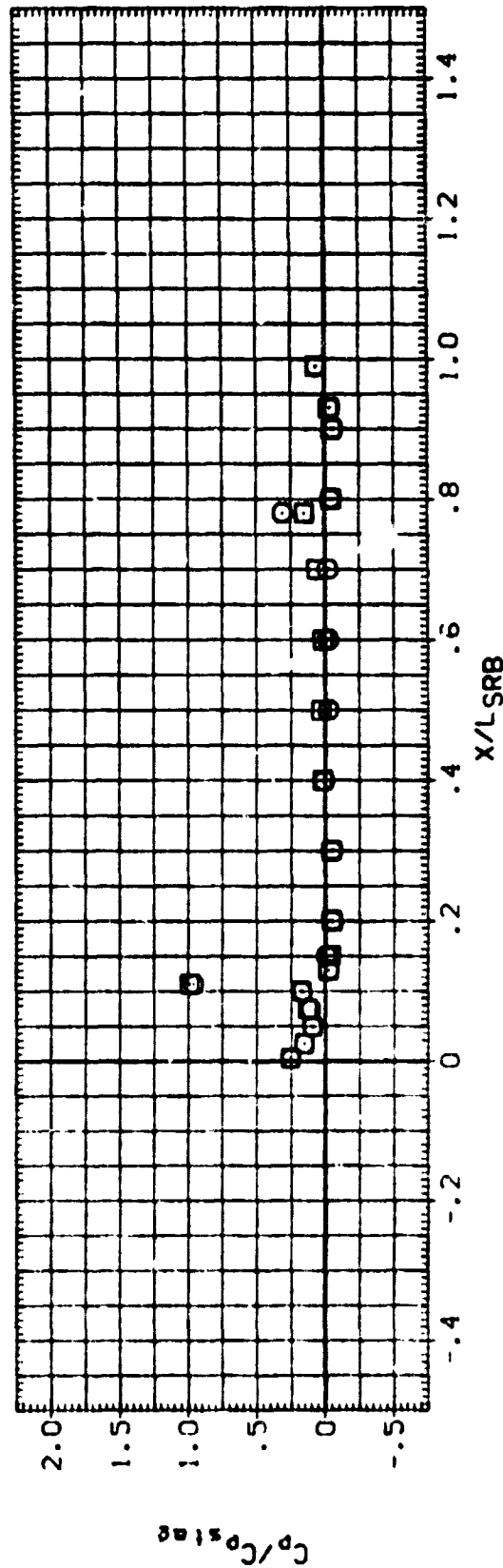
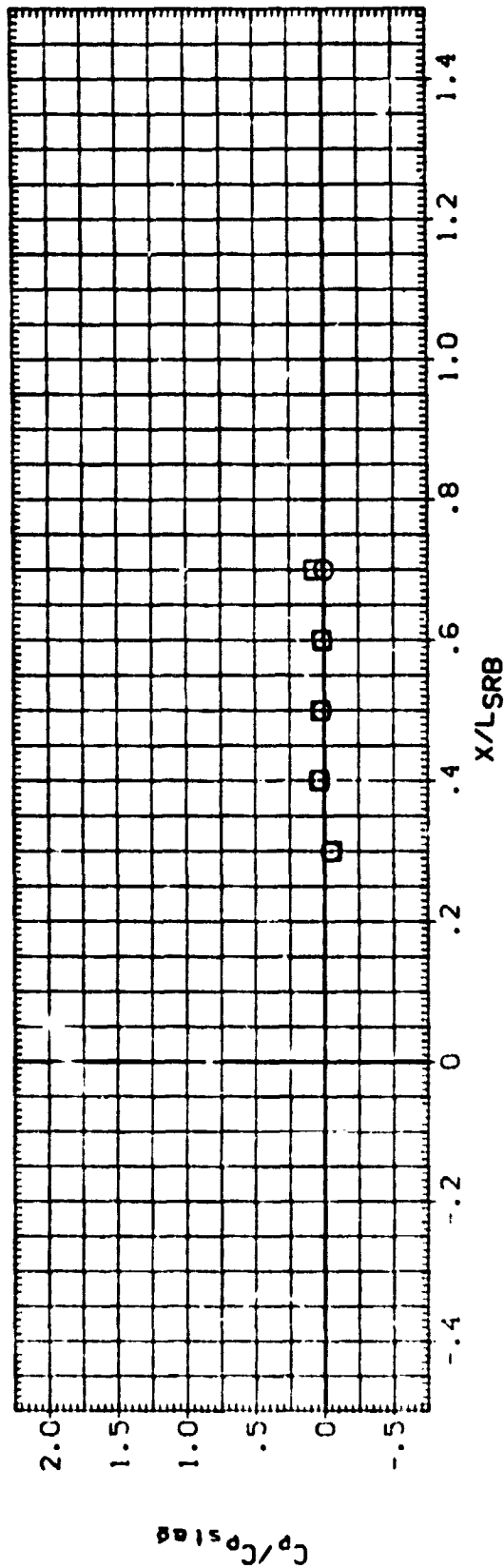


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. RSTR.

SYMBOL ALPHA PSI MACH
 -10.000 180.000 3.700
 -5.000 90.000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

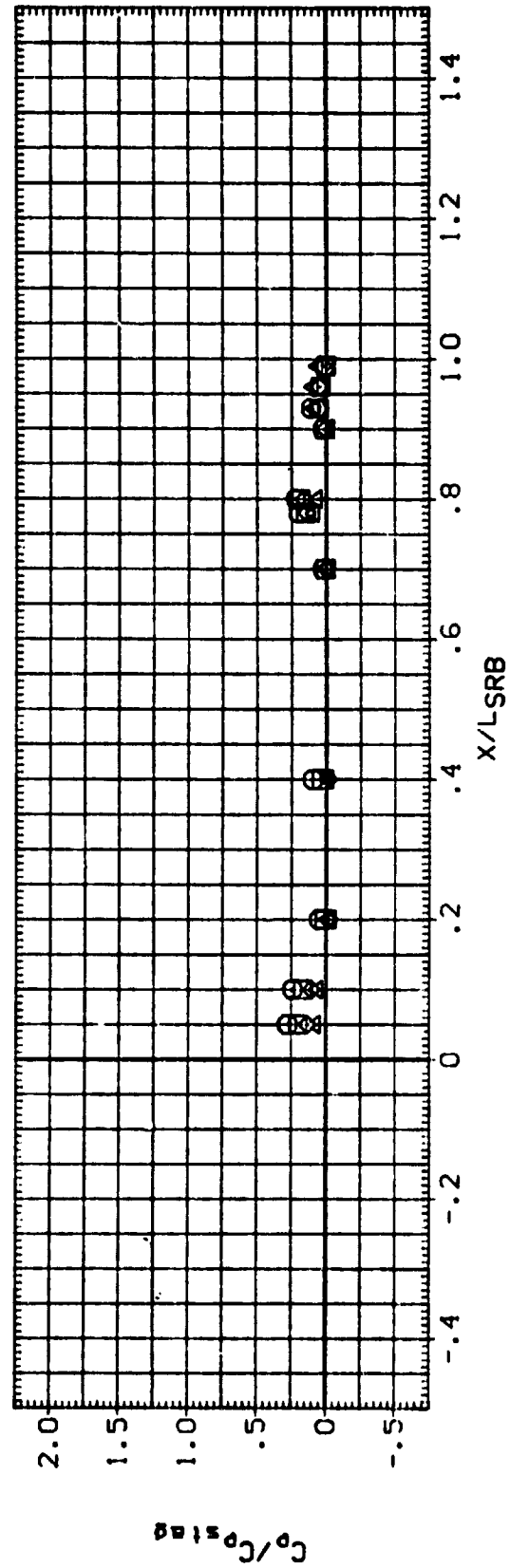
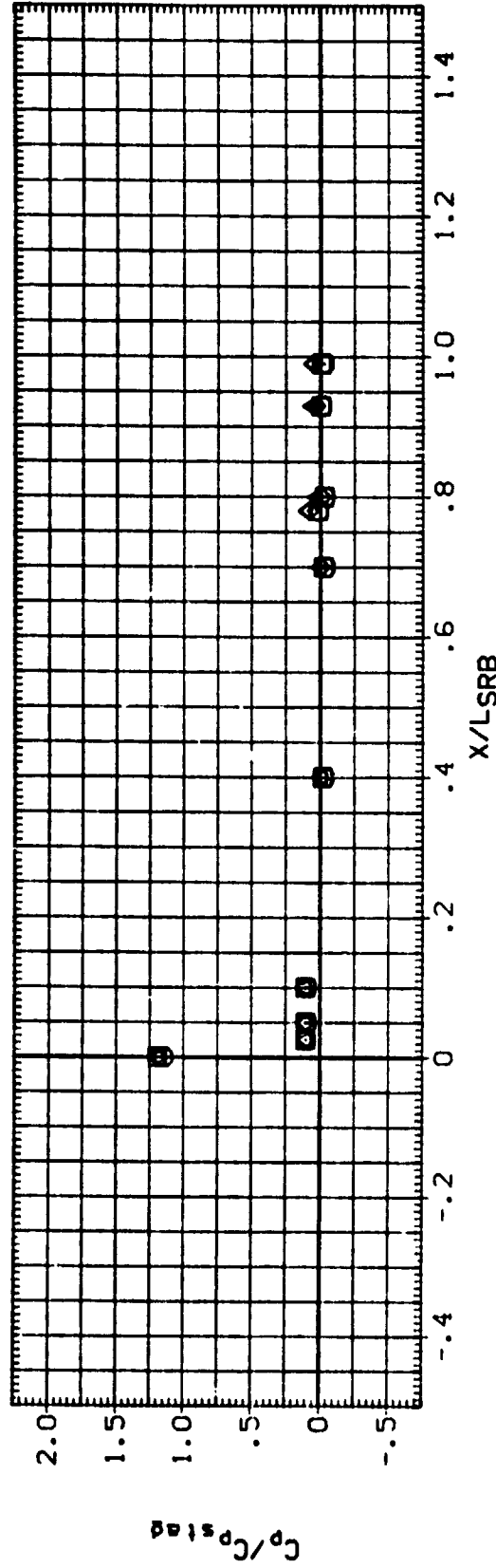


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(RQ3SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -10.000 225.000 3.700
 -5.000 210.000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

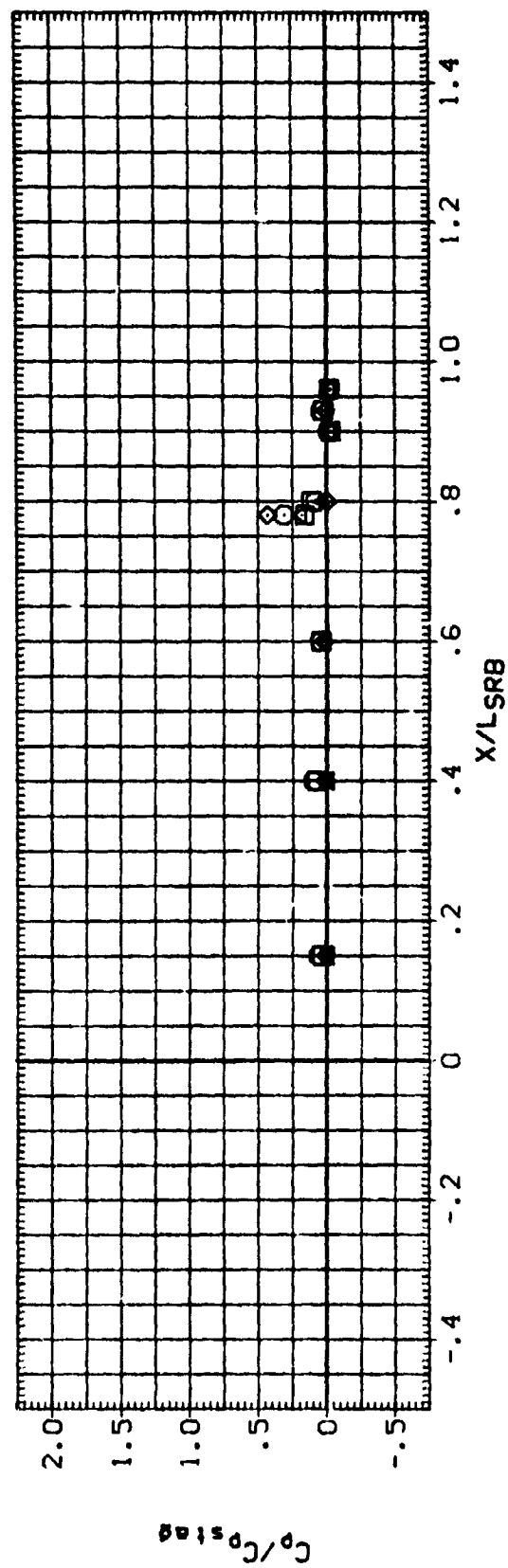
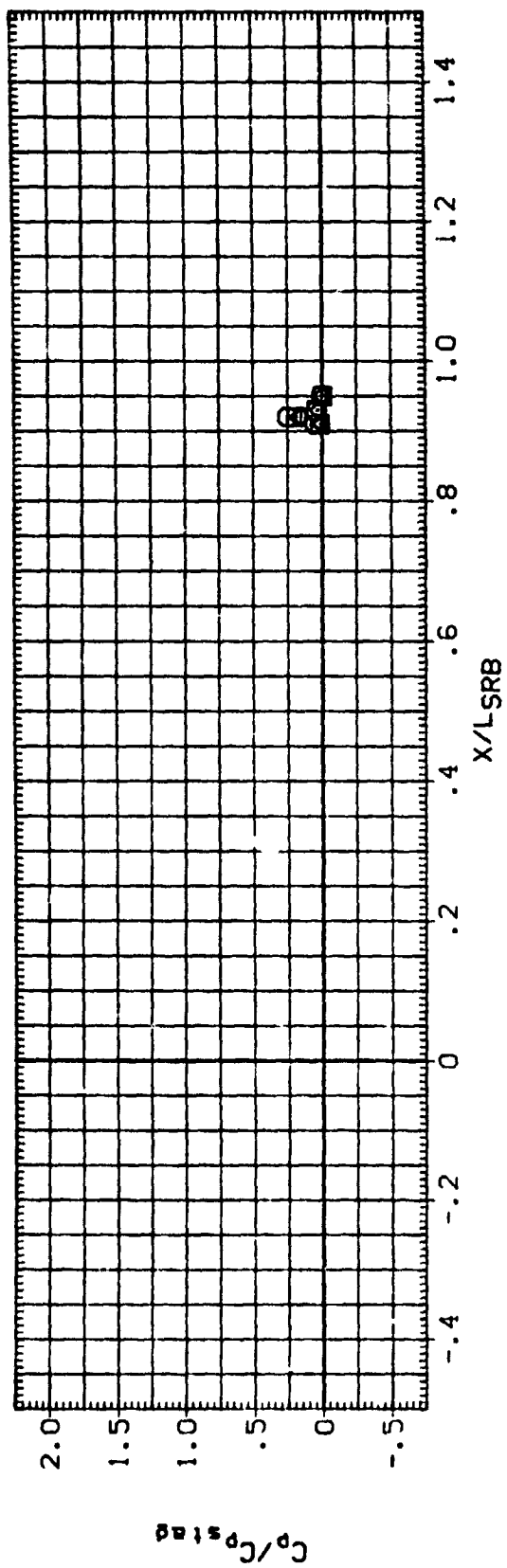


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(R03SAB) UPWT 1059 (IH4) 01-115-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -10.000 270.000 3.700
 -5.000 247.500
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

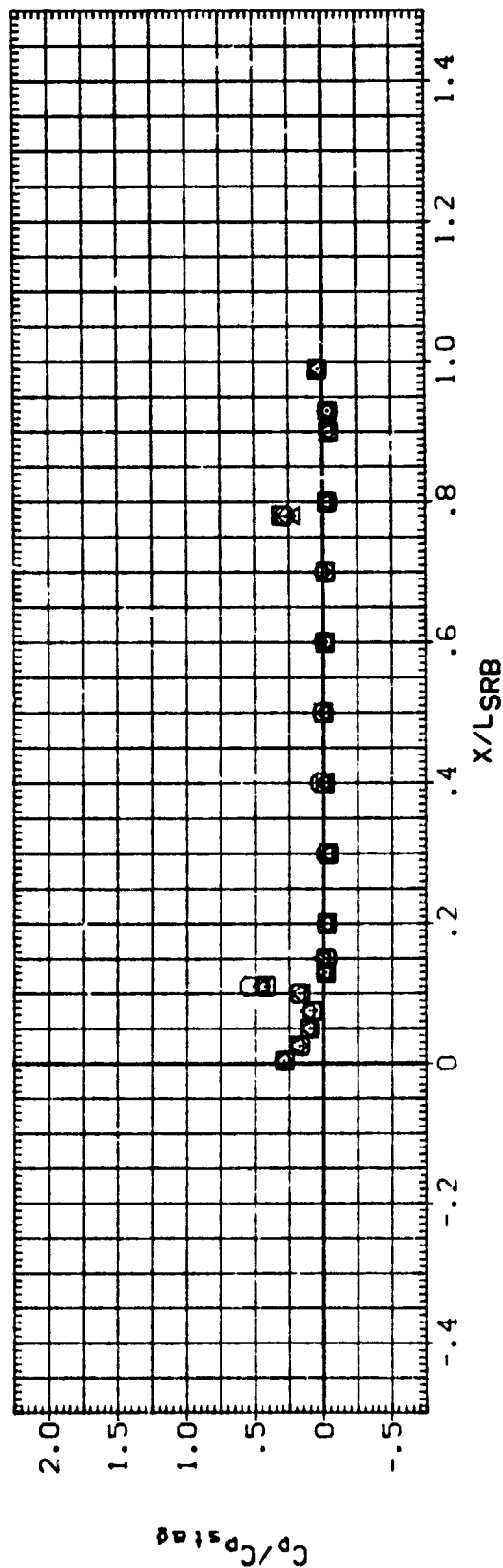
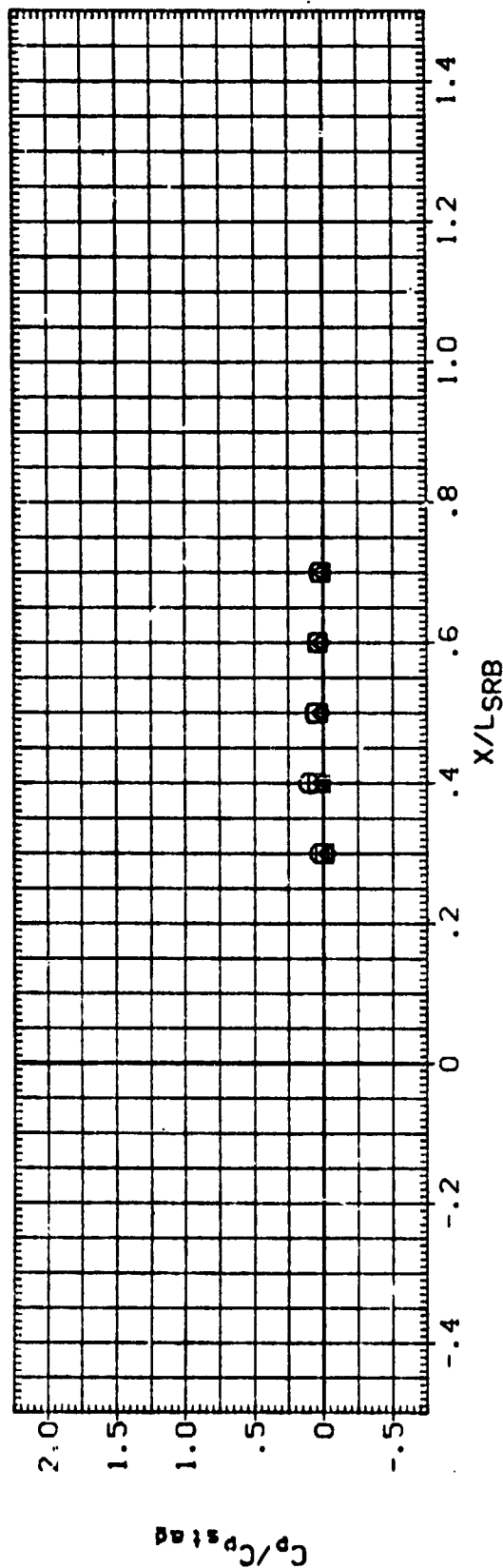


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER, BETA= 0. RN/L= 3.0

(RQ3SAB) UPWT 1053 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -10.000 180.000 4.600
 -5.000 50.000
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA .010
 RN/L

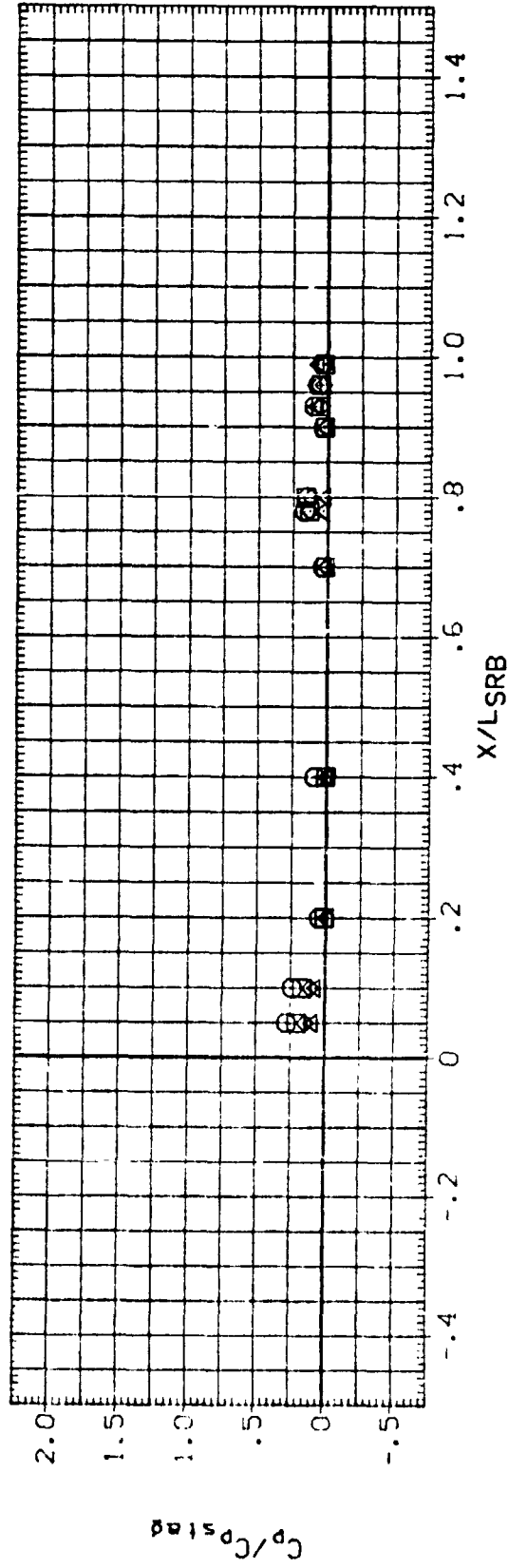
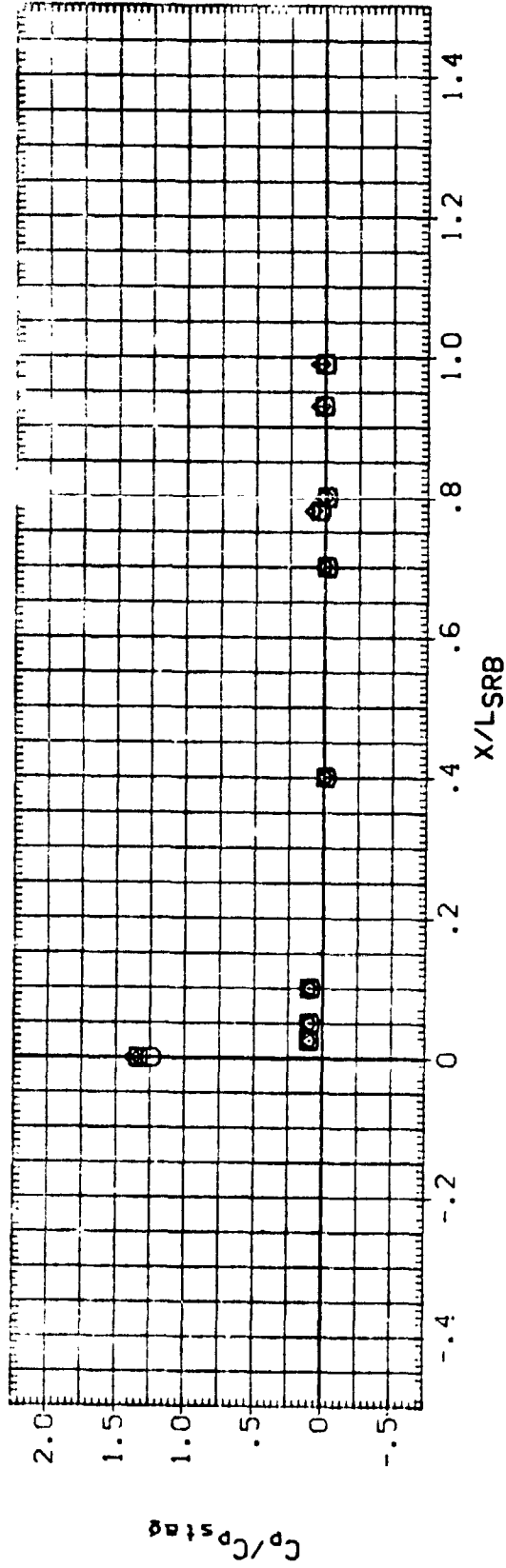


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

PARAMETRIC VALUES
RN/L 3.000 BETA .000

ALPHA PSI MACH
-10.000 225.000 4.600
-5.000 210.000
.0000
5.000

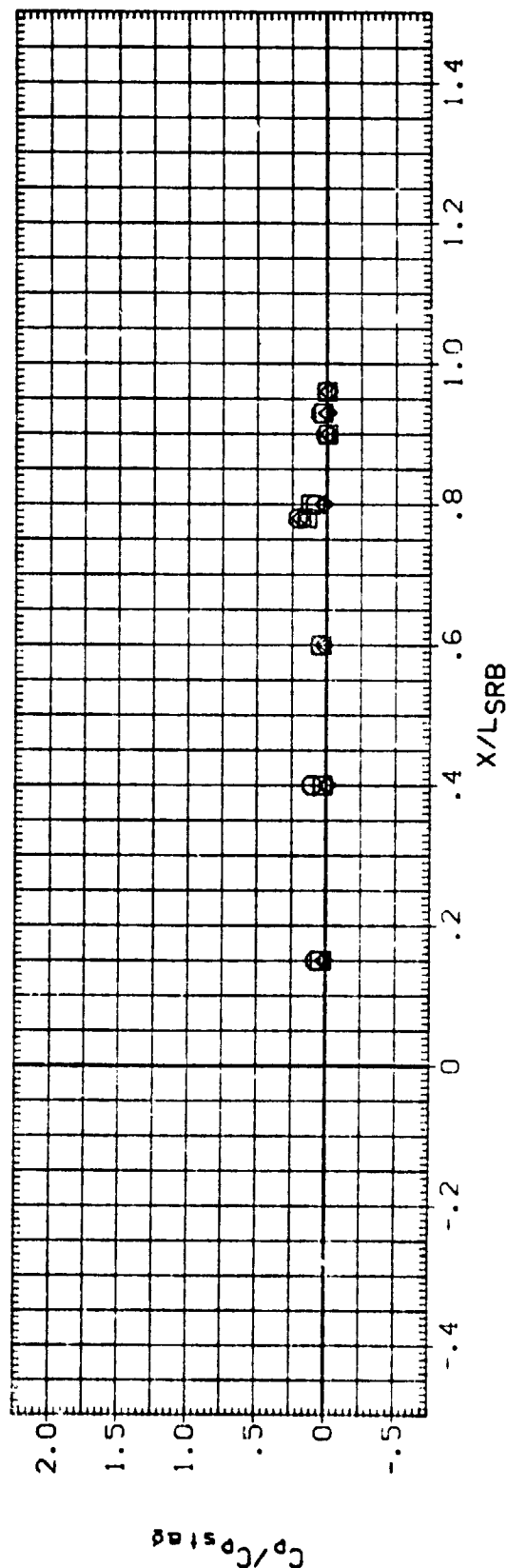
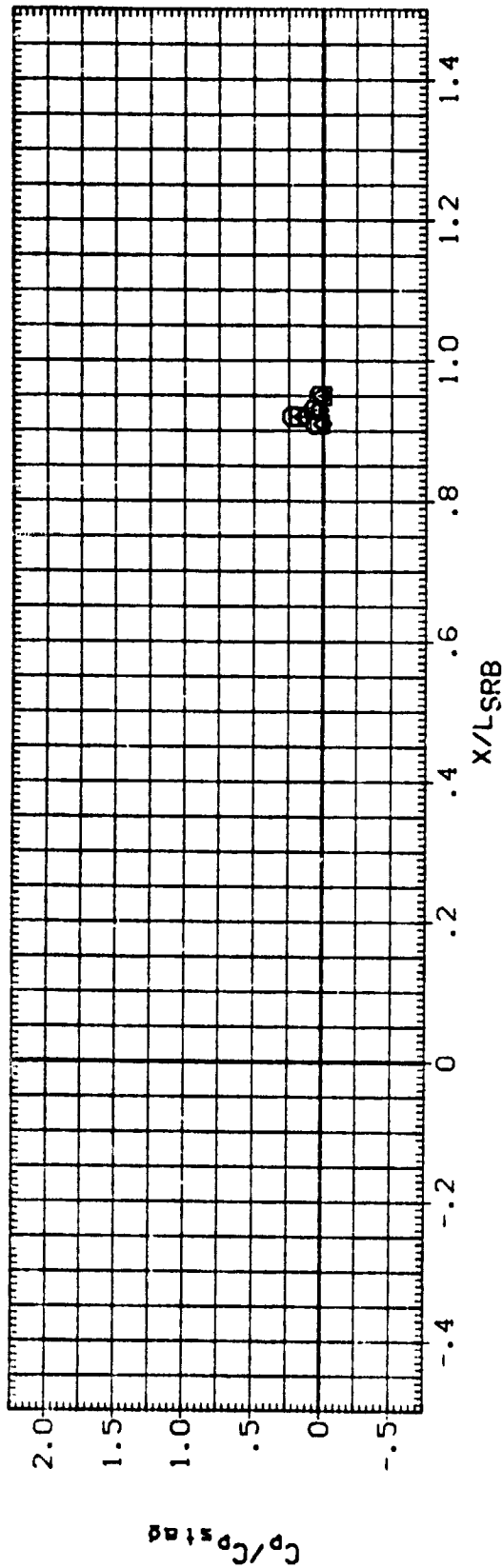


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER, BETA= 0. RN/L= 3.0

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ORIGINAL PAGE IS POOR

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	PSI	MACH	PARAMETRIC VALUES
	-10.000	270.000	4.600	3.000
	-5.000	247.500		BETA
	.000			.000
	5.000			

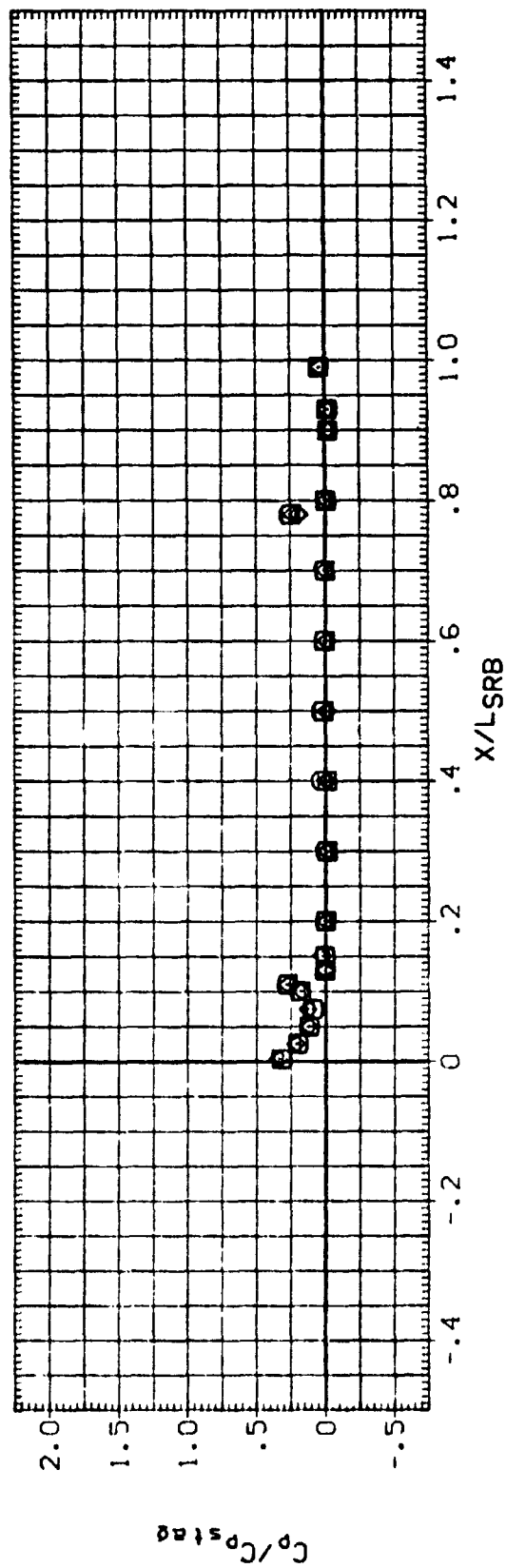
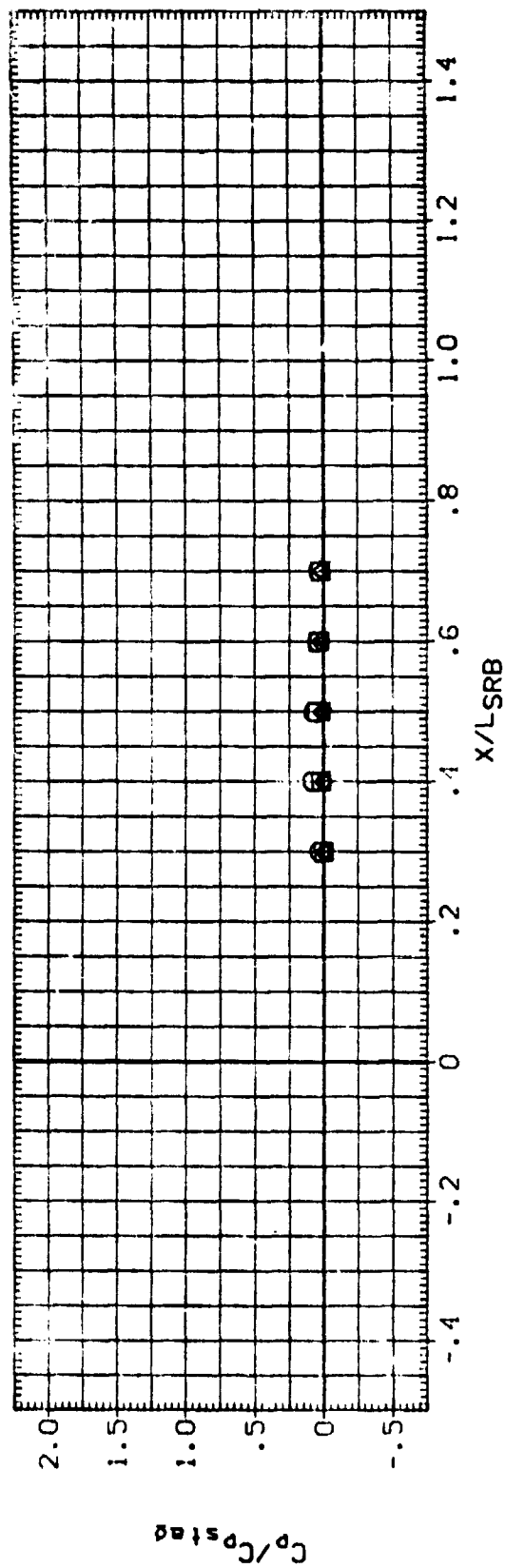


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET
BOOSTER, BETA= 0. RN/L= 3.0

(RQ3SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPH X/LSFB MACH 3.000 BETA .000

RN/L

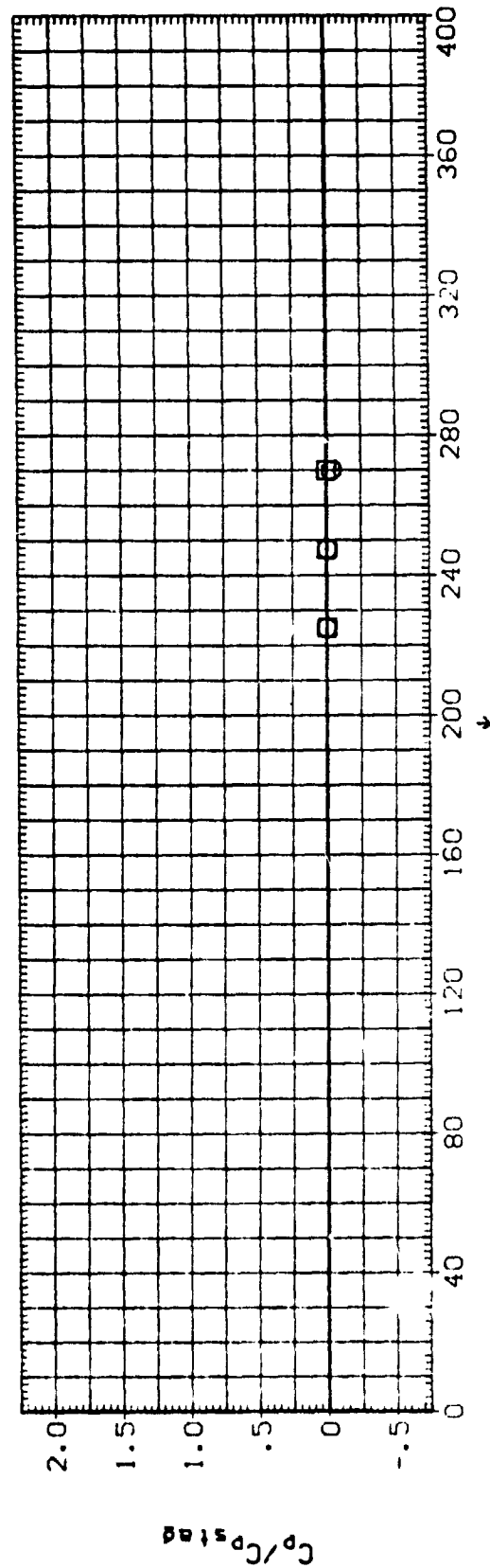
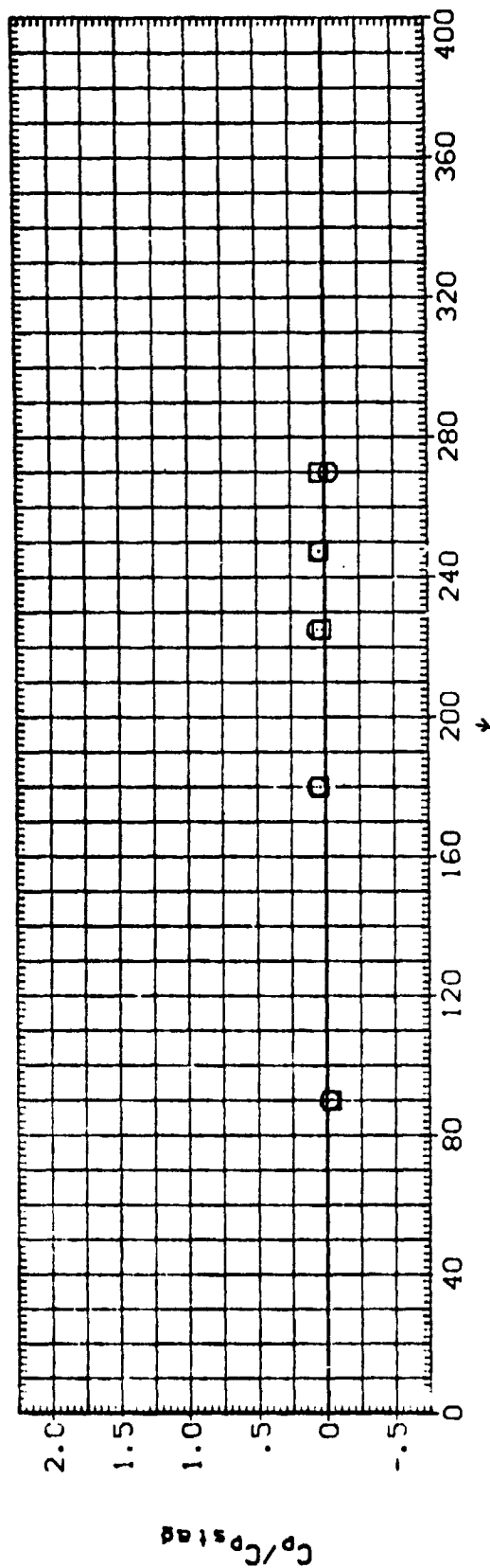


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(RQ3SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSP8 MACH
 8 .000 .780 2.360
 5.000 .700

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

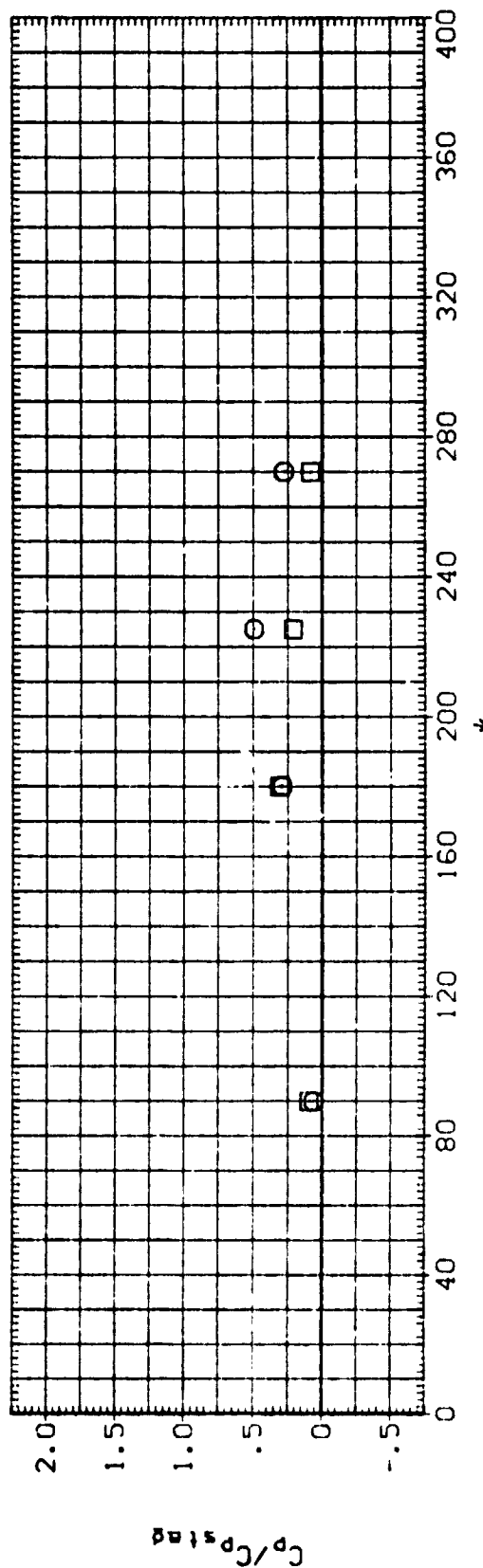
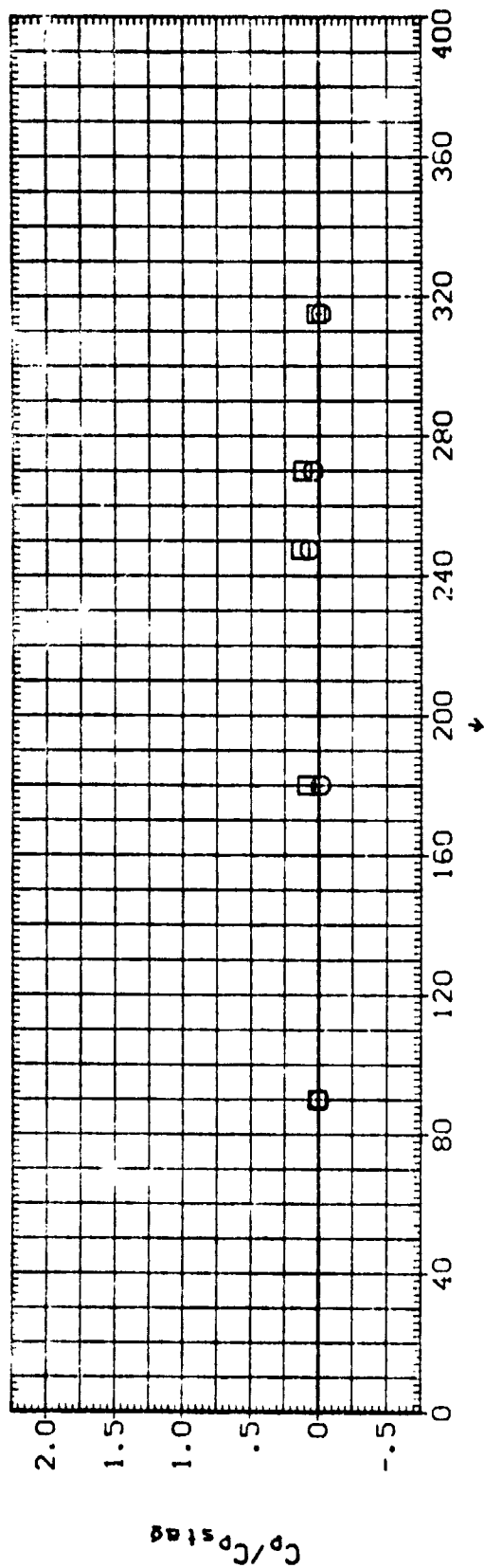


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/L SRB MACH
 8 .000 .930 2.360
 5.000 .800

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

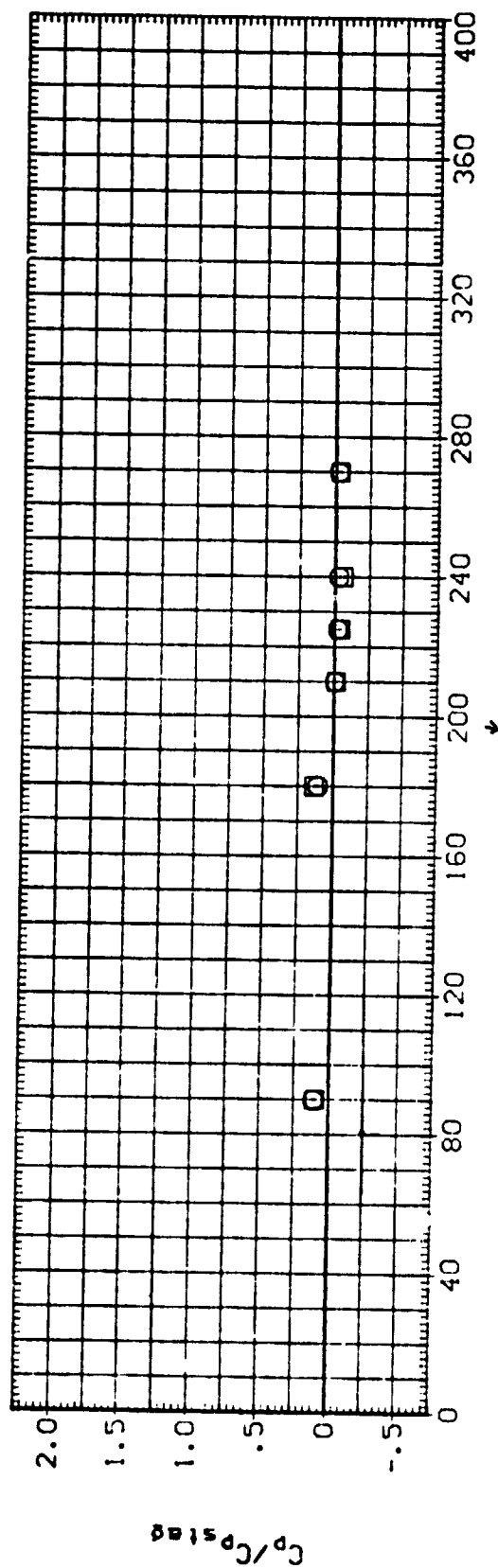
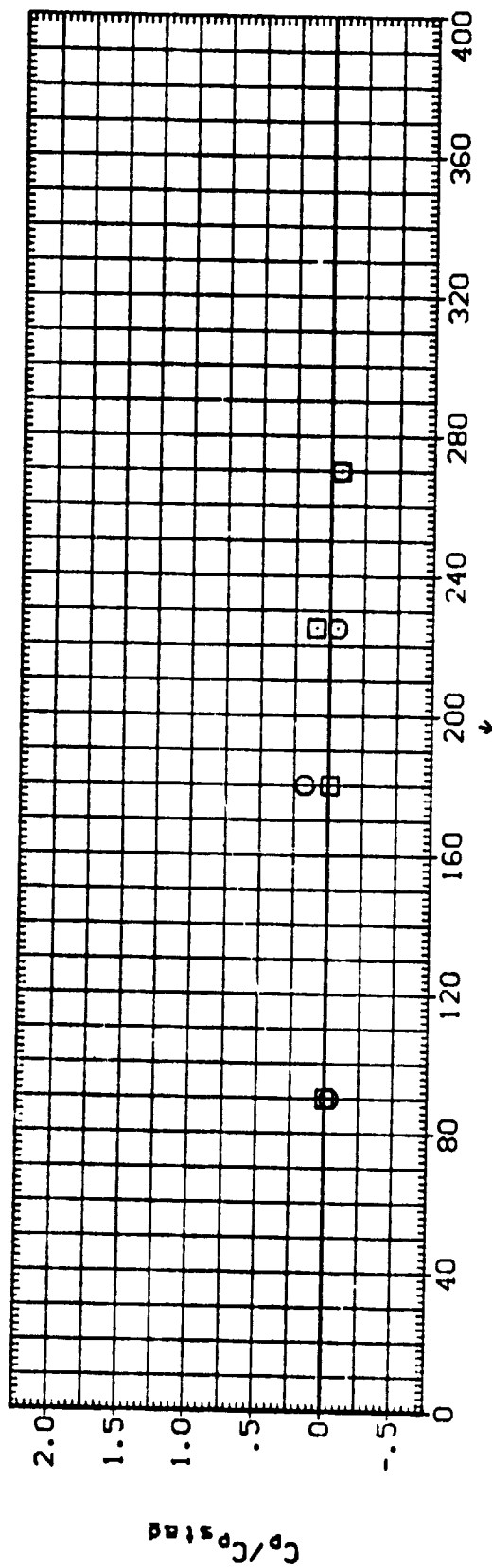


FIG. 21 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA = 0. RN/L = 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/L SRB MACH
 8 .000 .990 2.360
 5.000 .960

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

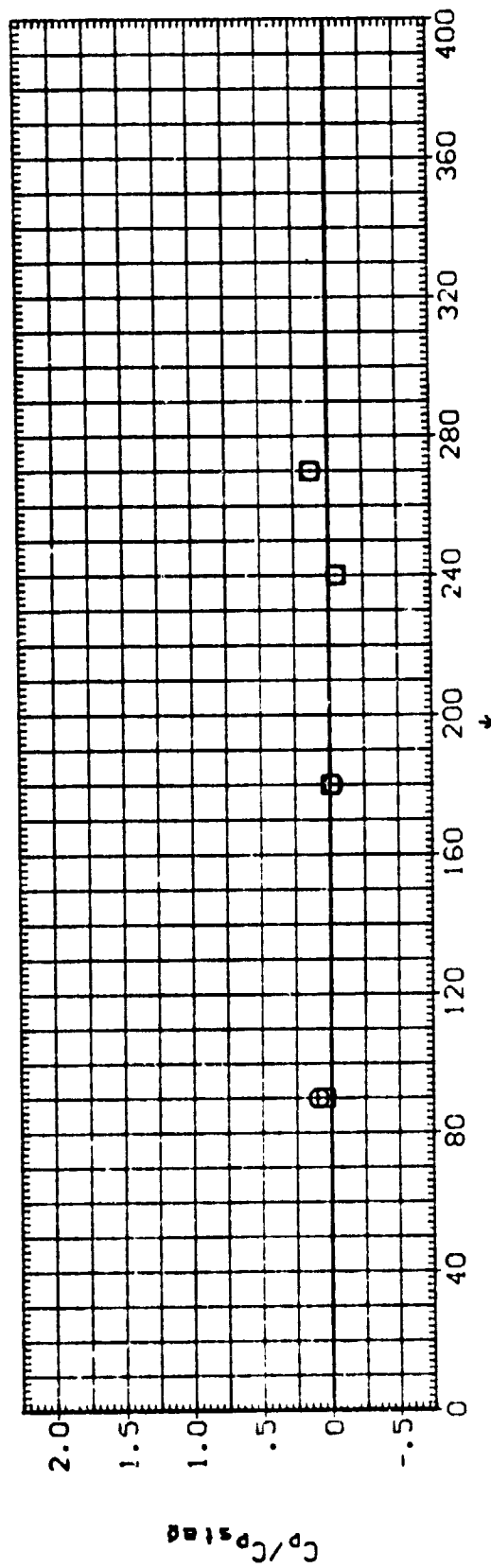
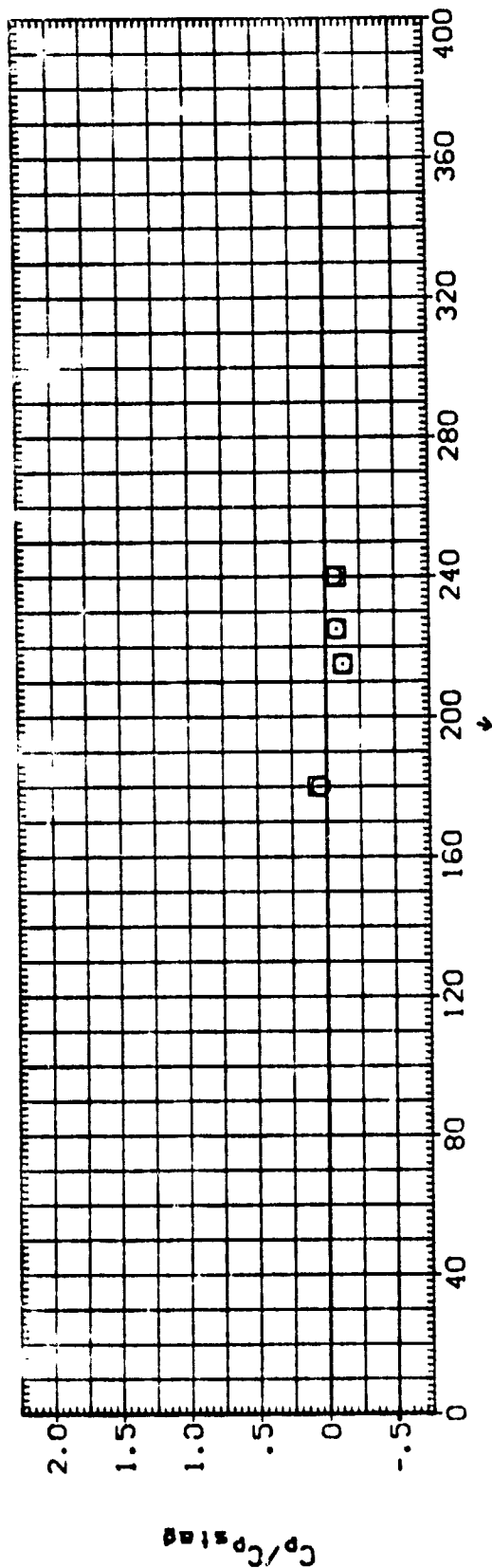


FIG. 21 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	X/L SEP	MACH	RN/L	PARAMETRIC VALUES
□	.003	.600	2.950		3.000 BETA .000
□	5.000	.400			

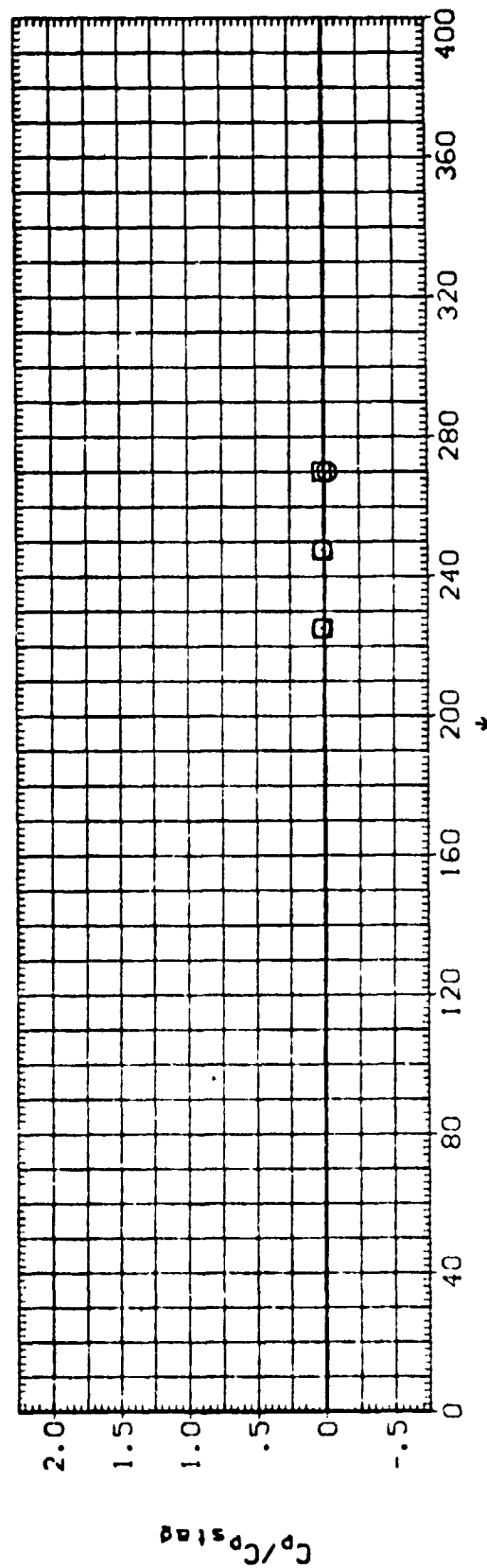
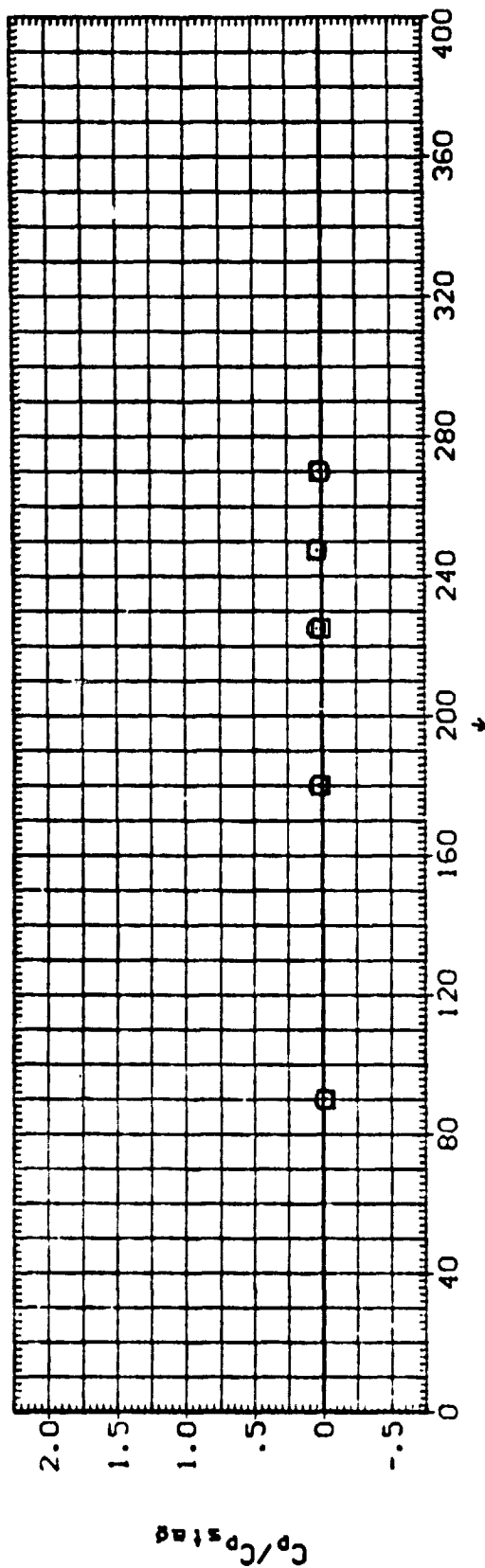


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(RQ3SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSPB HACH
 8 .000 .780 2.950
 5.000 .700

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

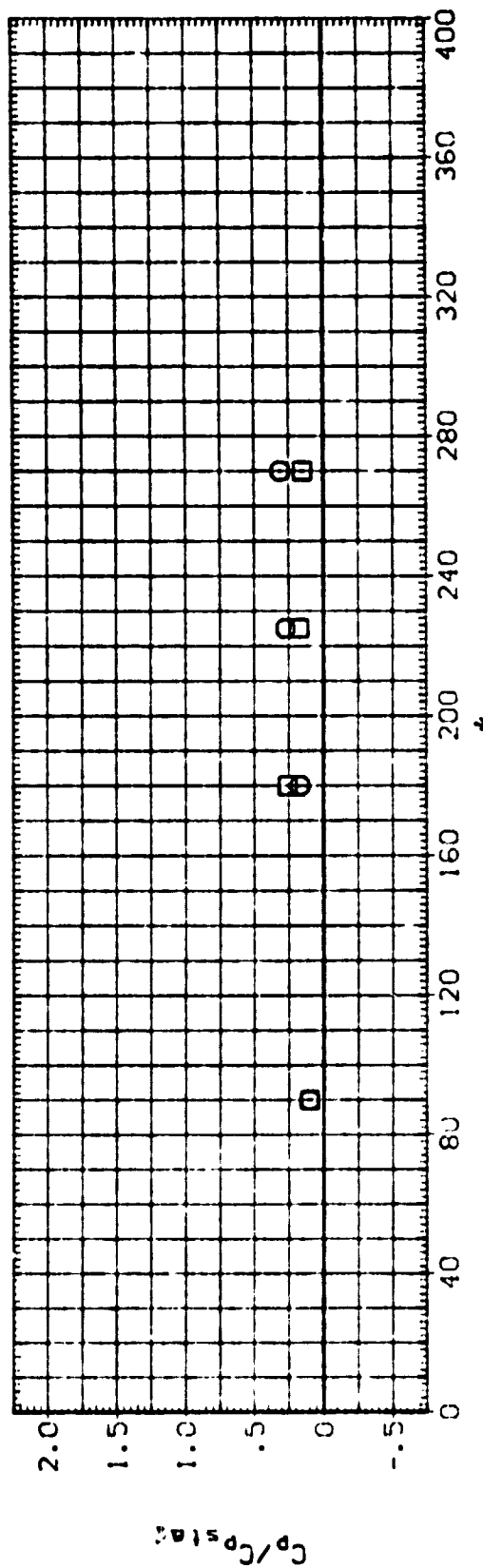
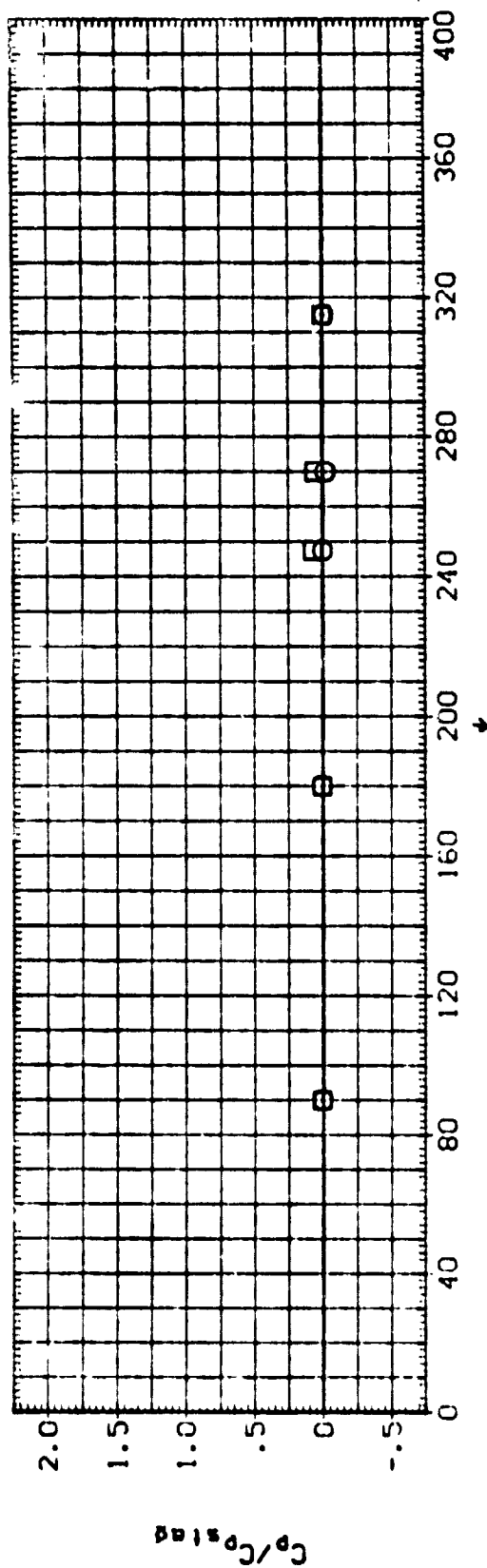


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(RQ3SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALP-1
 5.000

X/LSP3
 .930
 .800

MACH
 2.950

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

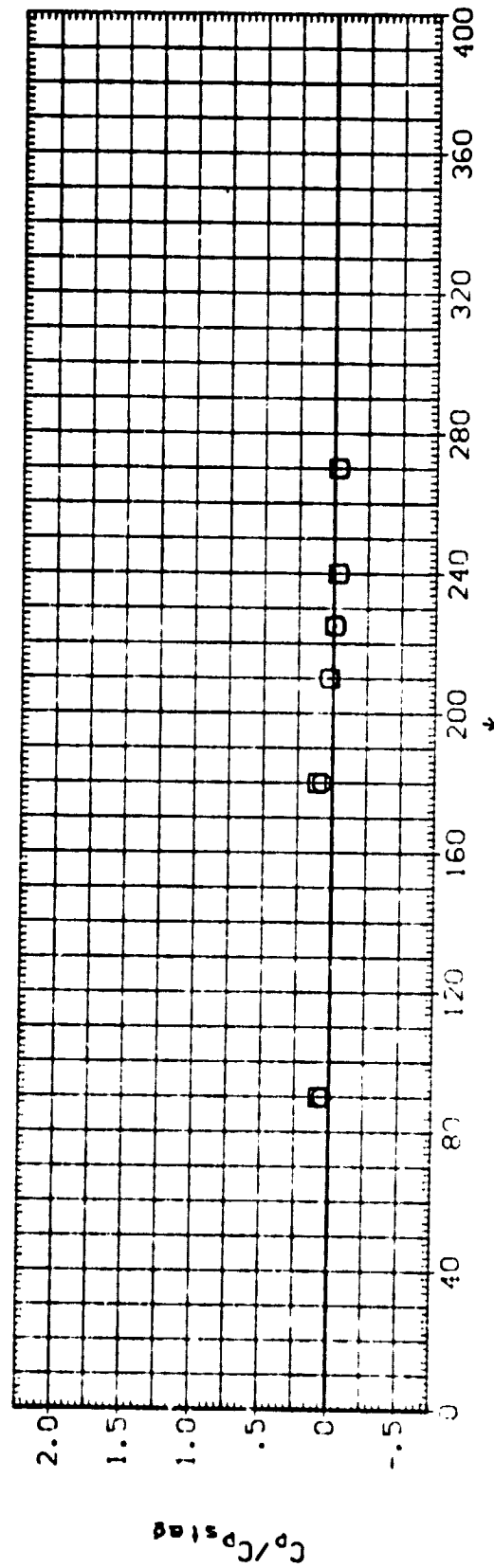
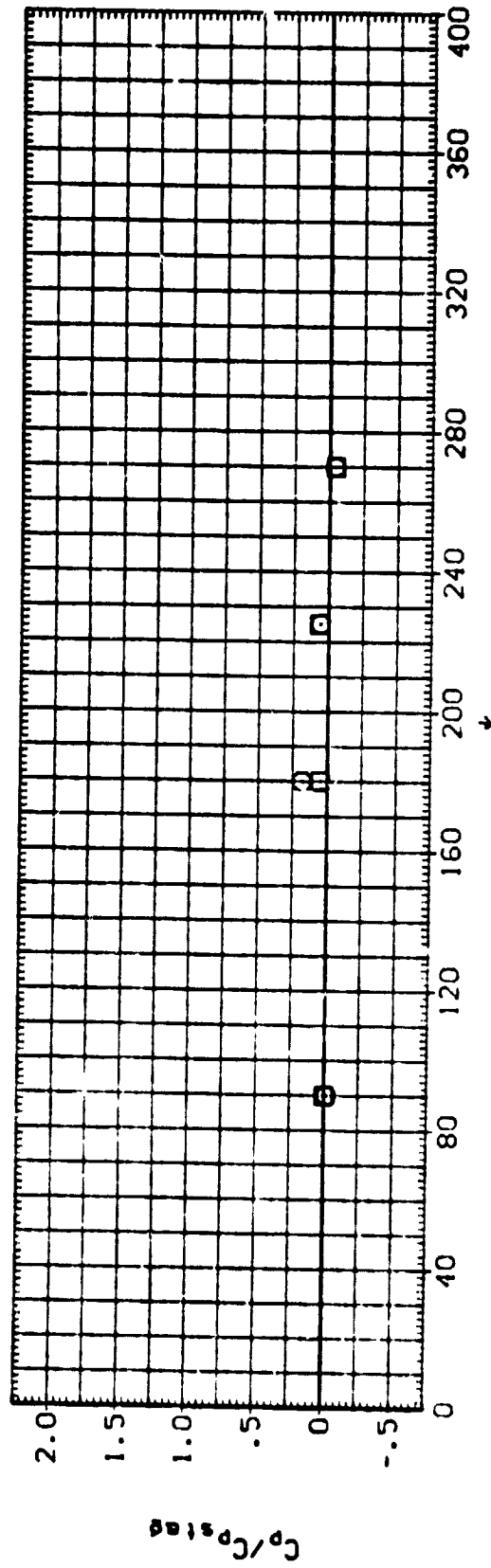


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA K/LSRB MACH
 5.000 .990 2.950

PARAMETRIC VALUES
 RN/L 3.000 BETA .060

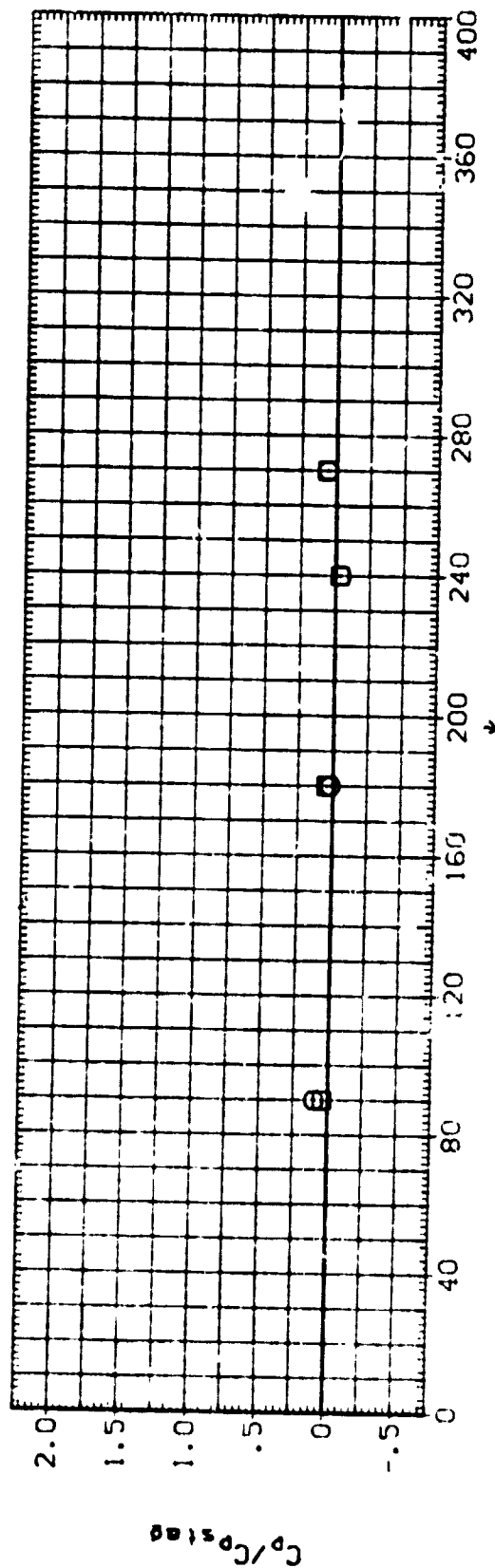
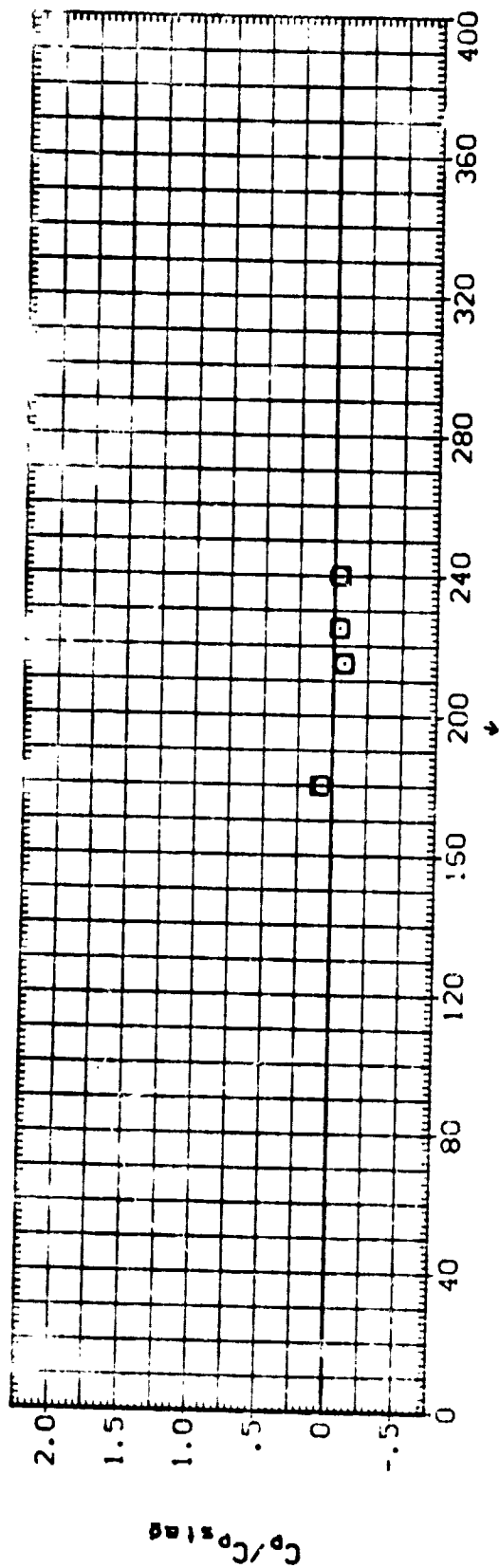


FIG. 21 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
 -10.000
 -5.000
 .000
 5.000

X/LSRB MACH
 .600 3.700
 .400

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

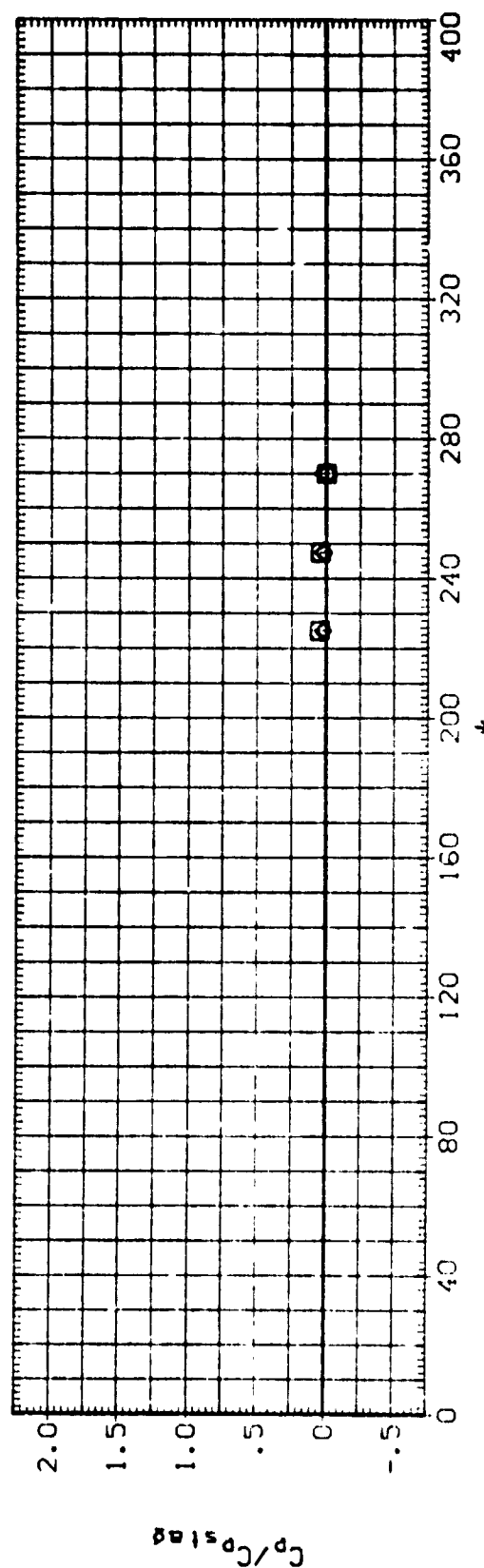
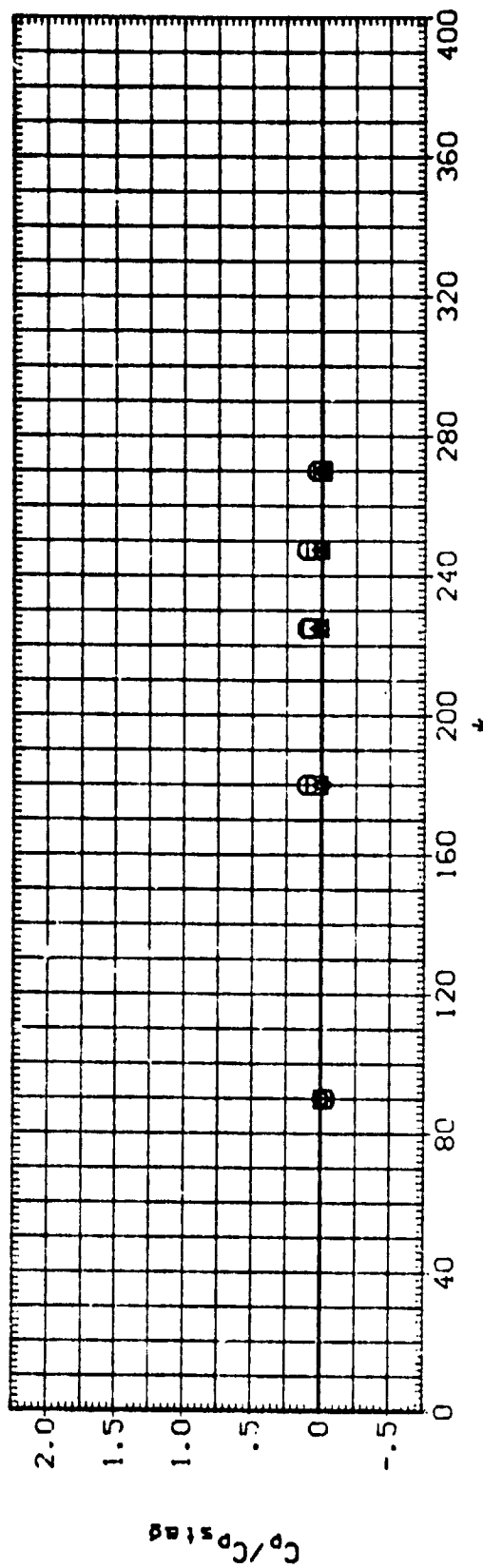


FIG. 21 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	X/LSPB	MACH	RN/L	PARAMETRIC VALUES
⊗	-10.000	.780	3.700		BETA
⊙	-5.000	.700			3.000
⊠	.000				.000
⊡	5.000				

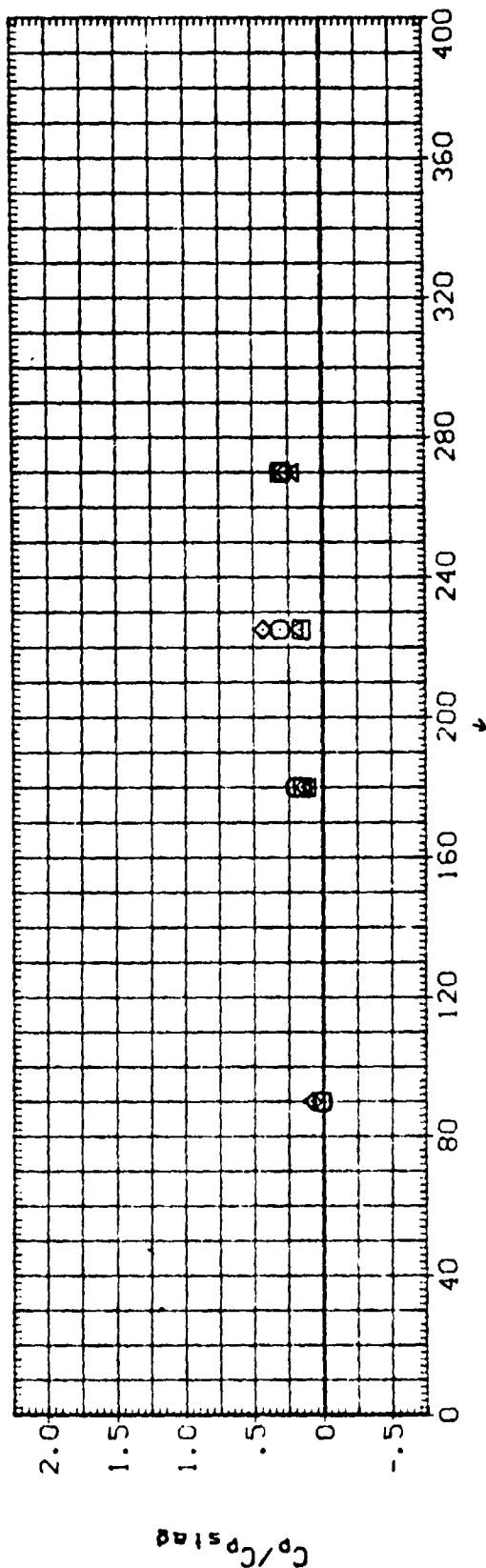
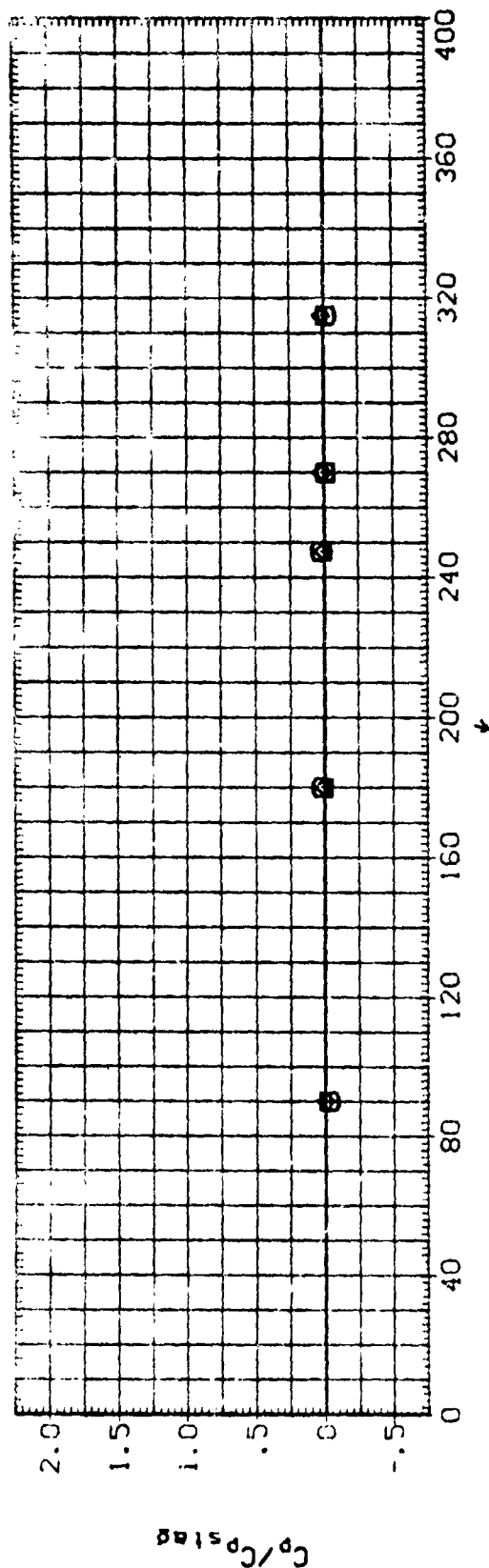


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	X/LSRB	MACH	RN/L	PARAMETRIC VALUES
	-10.000	.930	3.700		3.000 BETA
	-5.000	.800			.000
	.000				
	5.000				

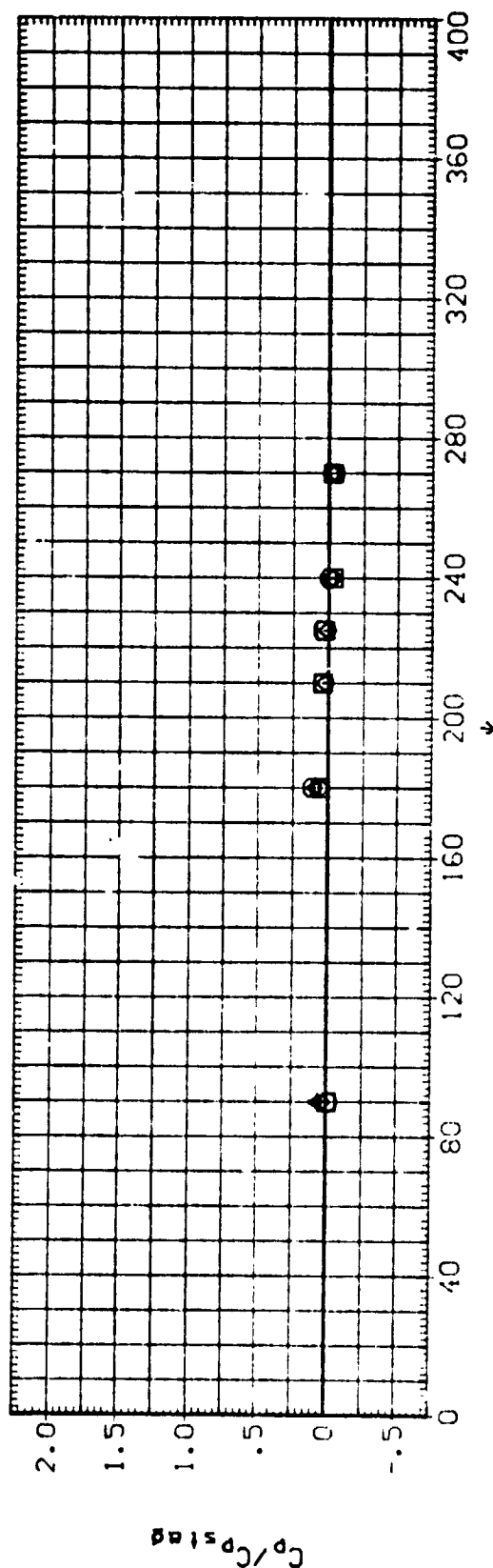
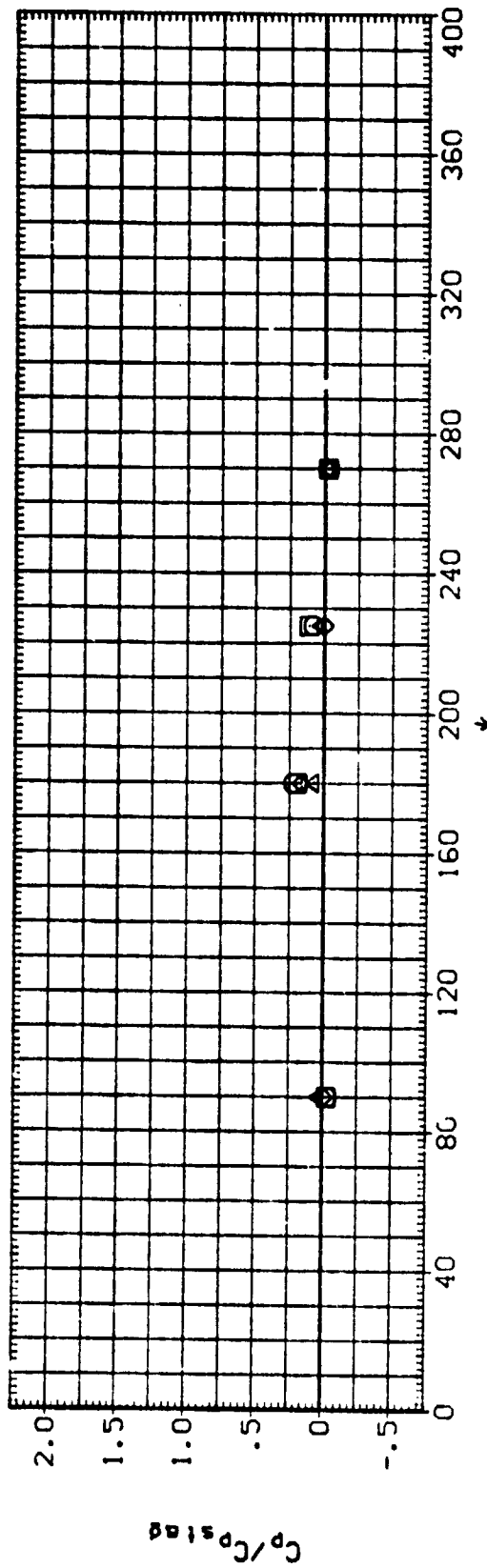


FIG. 21 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(RQ3SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 -10.000
 -5.000
 5.000

PARAMETRIC VALUES
 RN/ 3.000 BETA .06

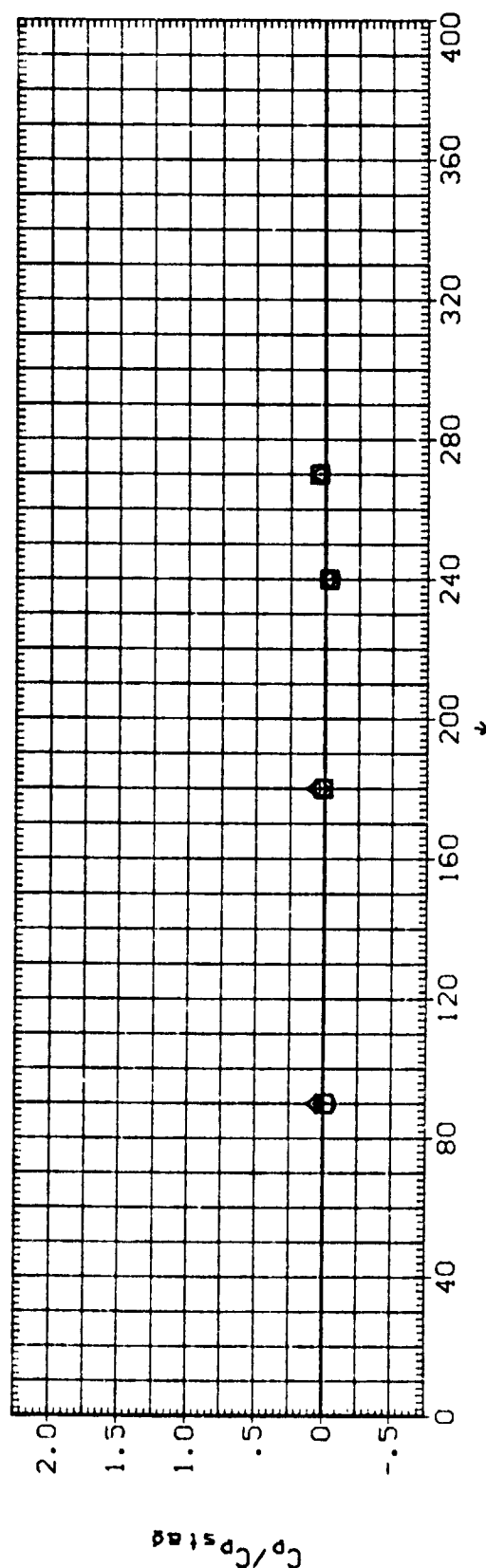
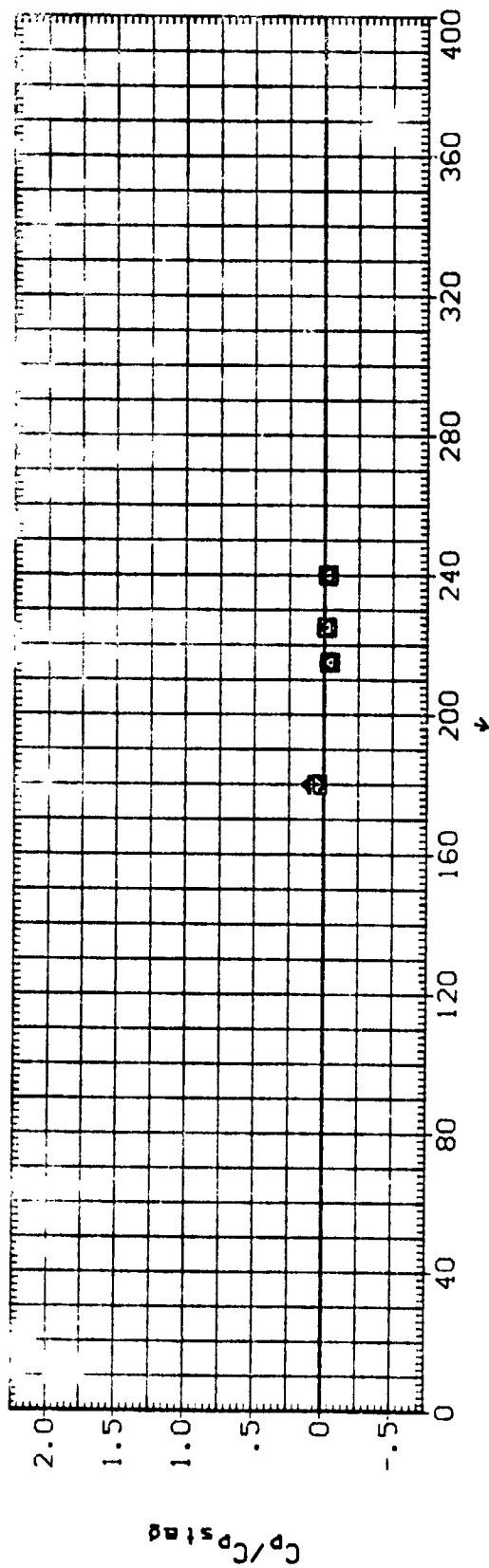



FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(RQ3SAB) UPWT 1059 (IH4) C1-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL  ALPHA
-10.000
-5.000
.000
5.000

X/L S98
-600
.400

MACH
4.500

RN/L

PARAMETRIC VALUES
3.000 BETA .000

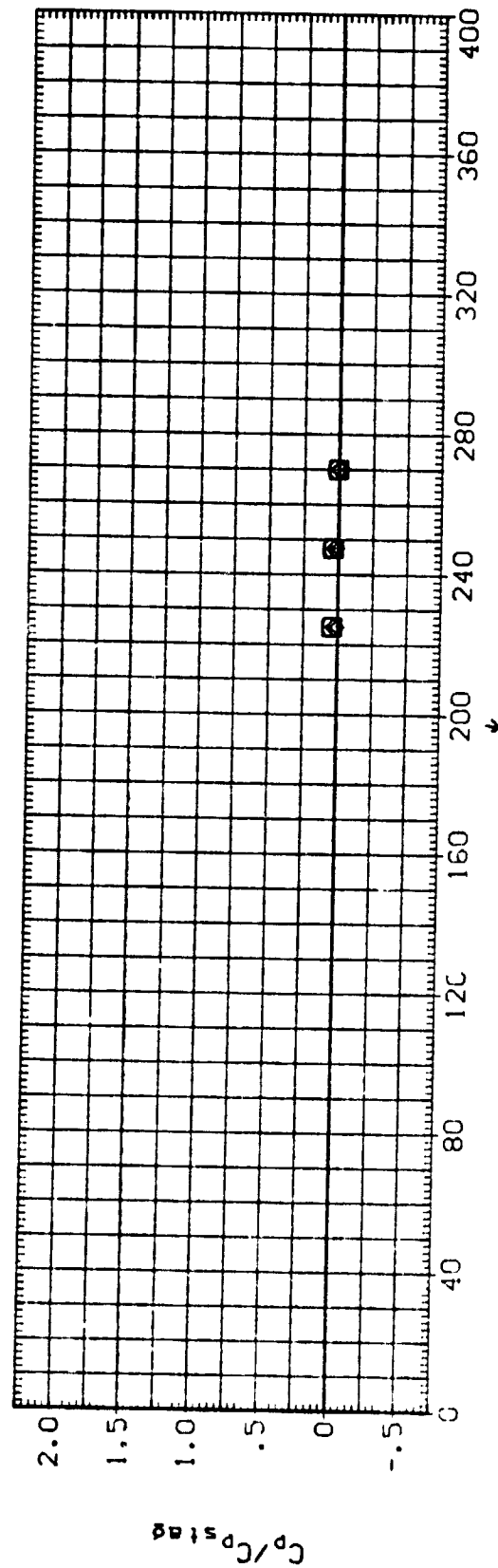
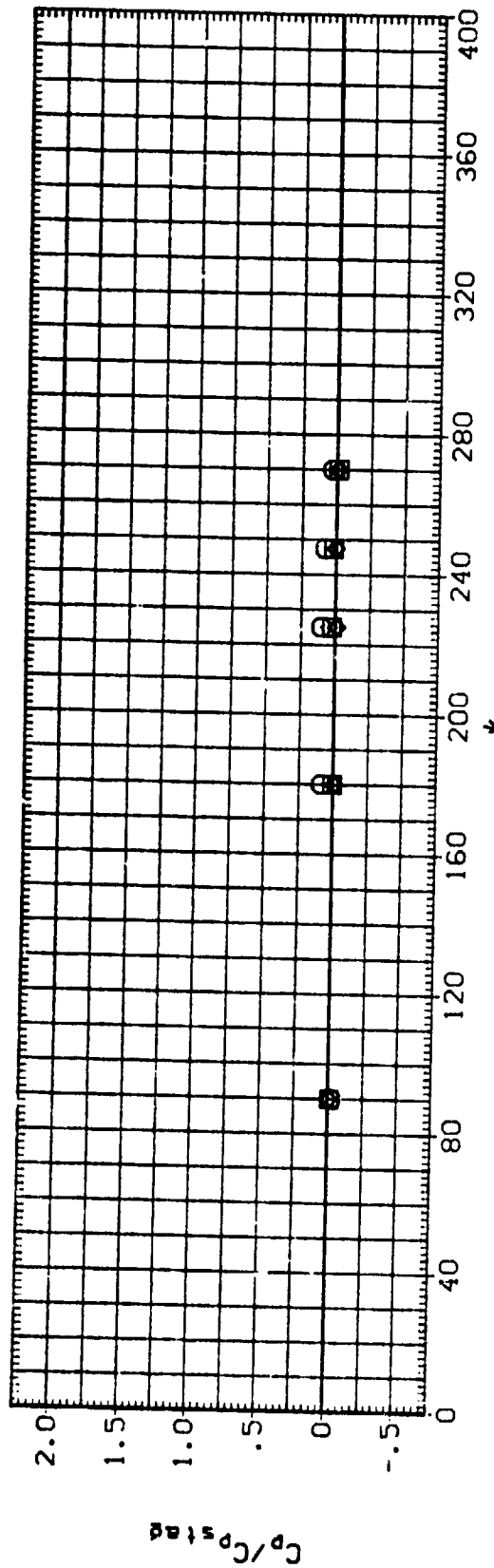


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

PARAMETRIC VALUES
RN/L 3.000 BETA

MACH 4.600

ALPHA
-10.000
-5.000
0.000
5.000

X/LSPB .780
.700

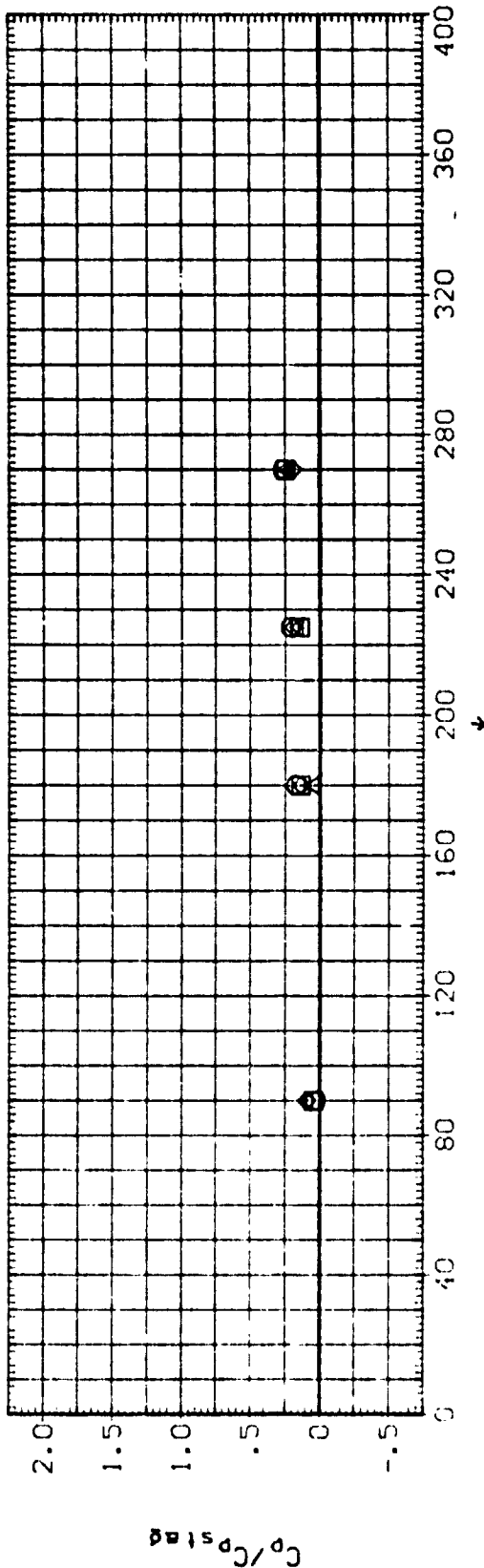
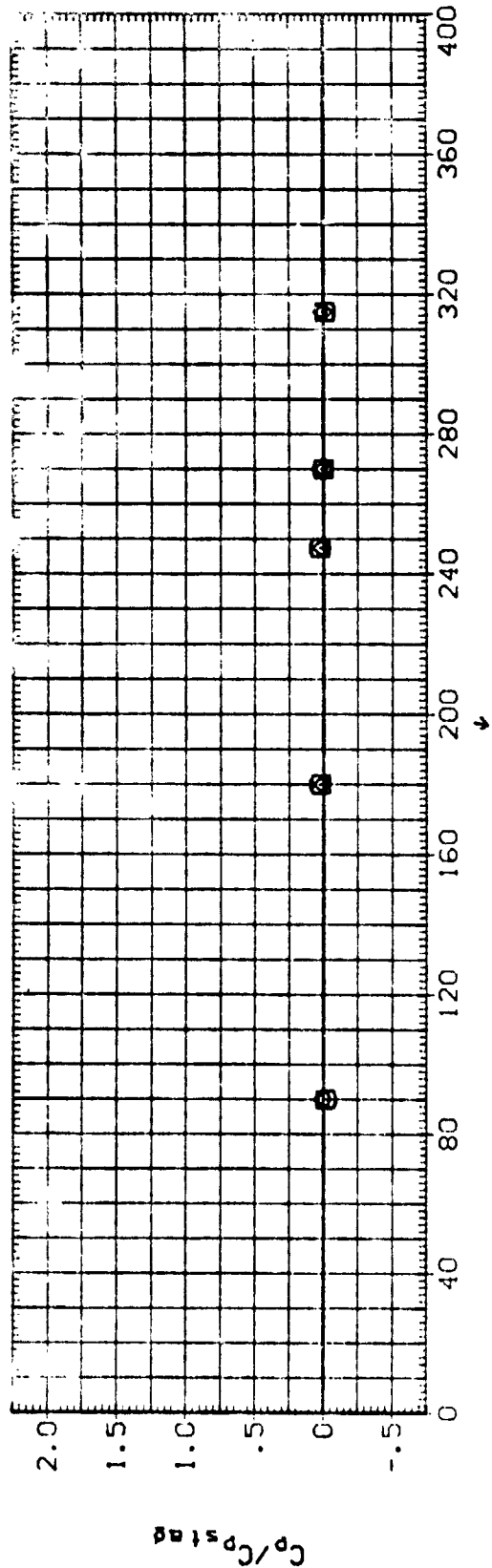


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(RQ3SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	K/LSPB	MACH	RN/L	PARAMETRIC VALUES
□	-10.000	.930	4.600		3.000 BETA .000
◇	-5.000	.800			
×	5.000				

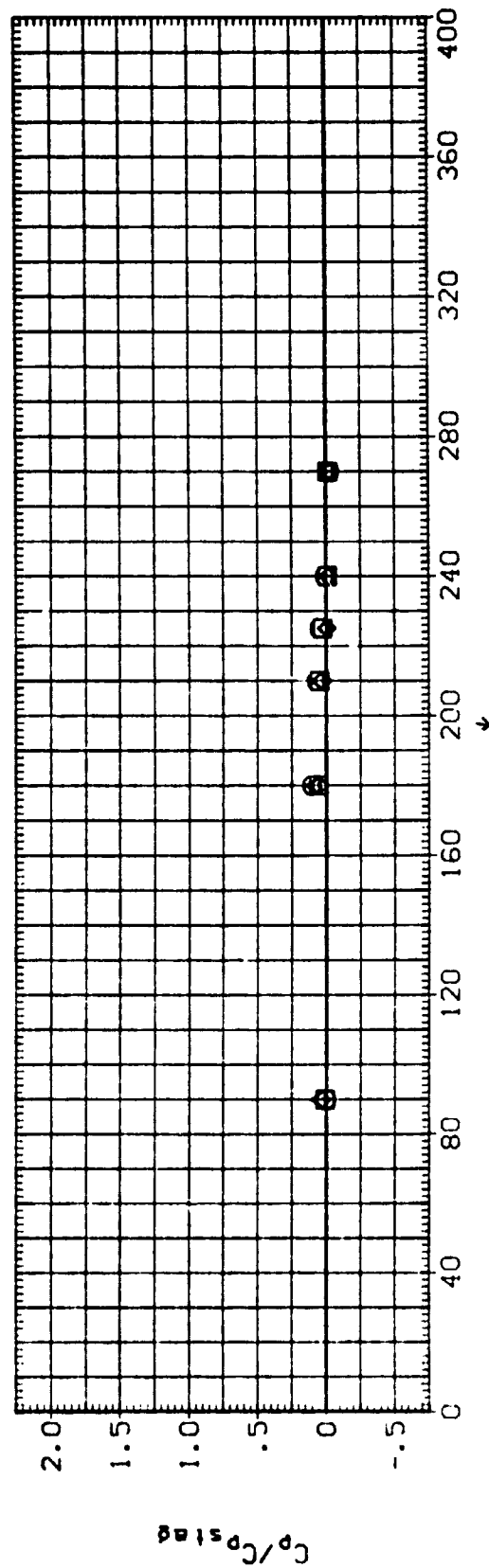
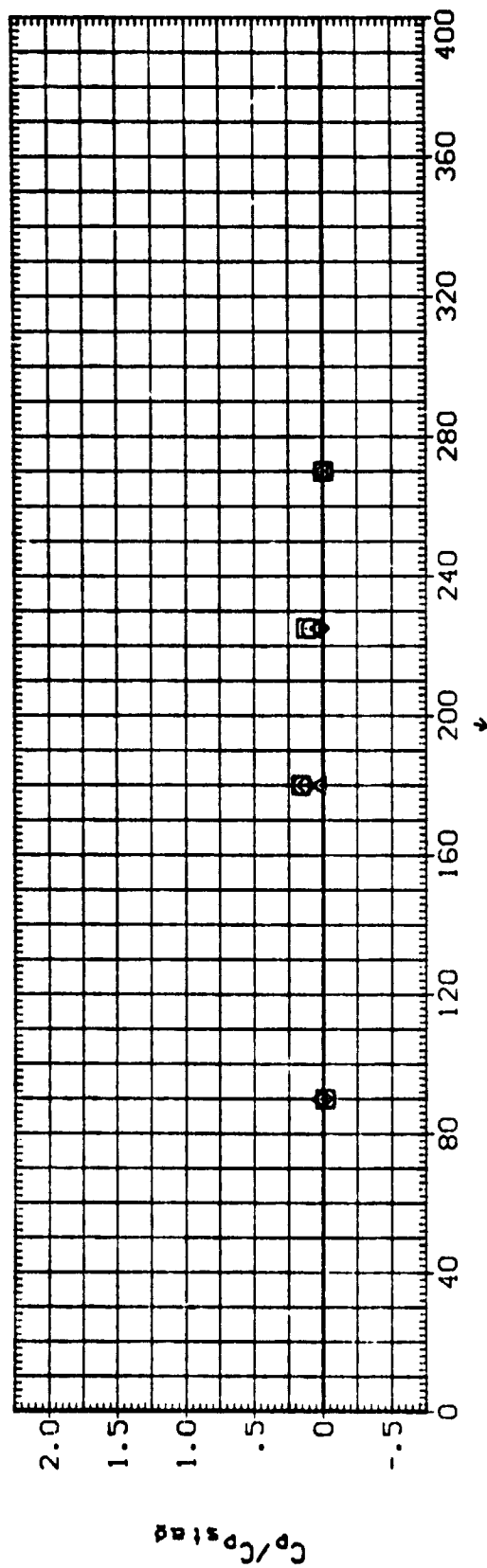


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SAB) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
-10.000
-5.000
0.000
5.000

X/LSPB MACH
.930 4.600
.960

PARAMETRIC VALUES
RN/L 3.000 CTA .000

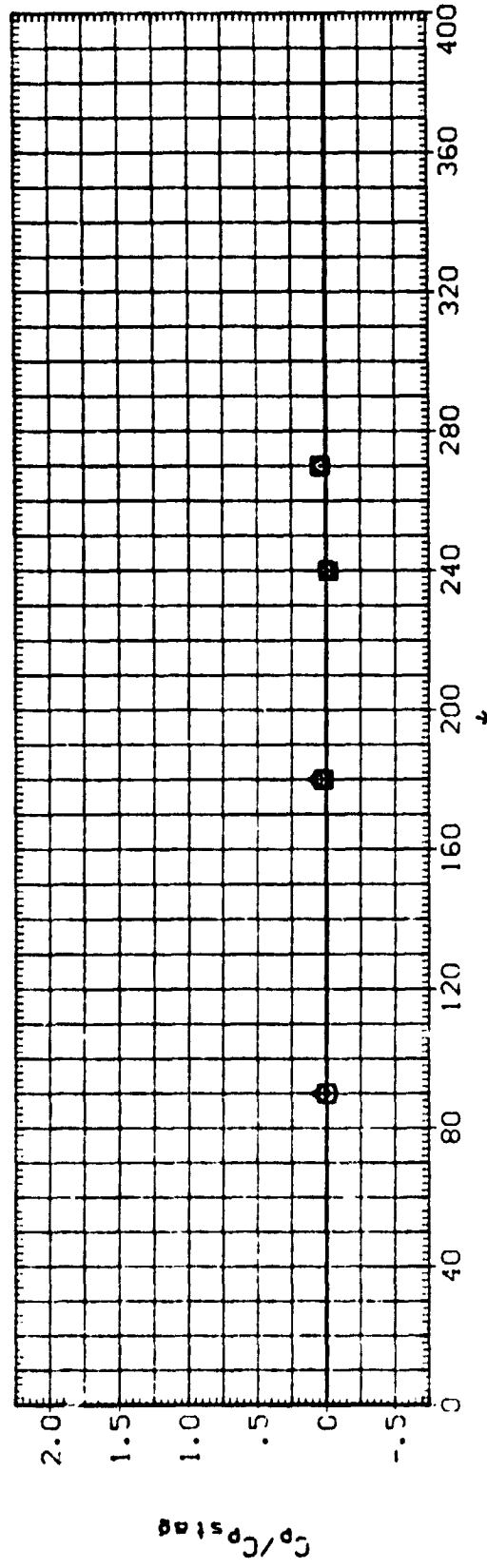
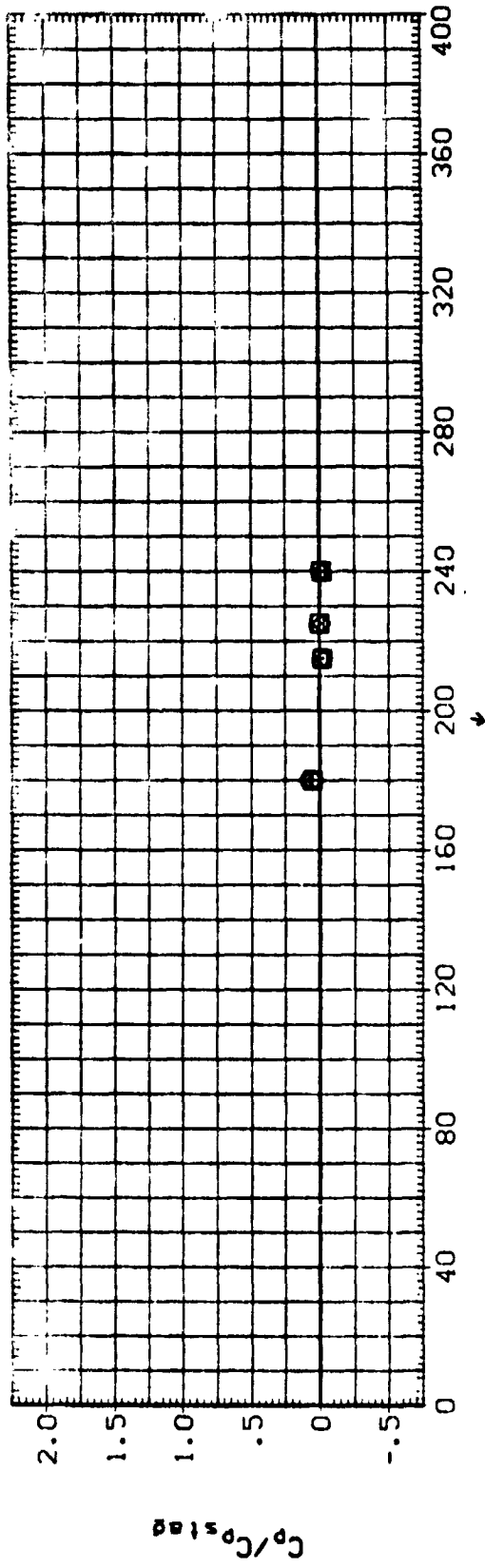


FIG. 21 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03BAC) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
8	5.000	95.000	2.950	5.000	BETA
					.000

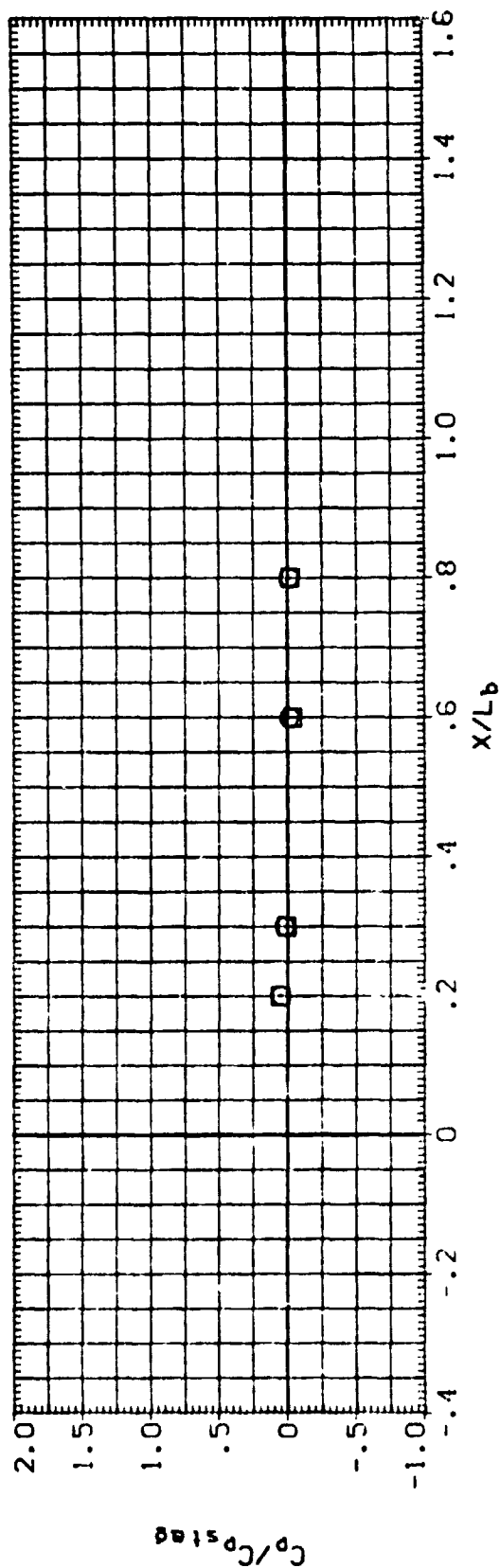
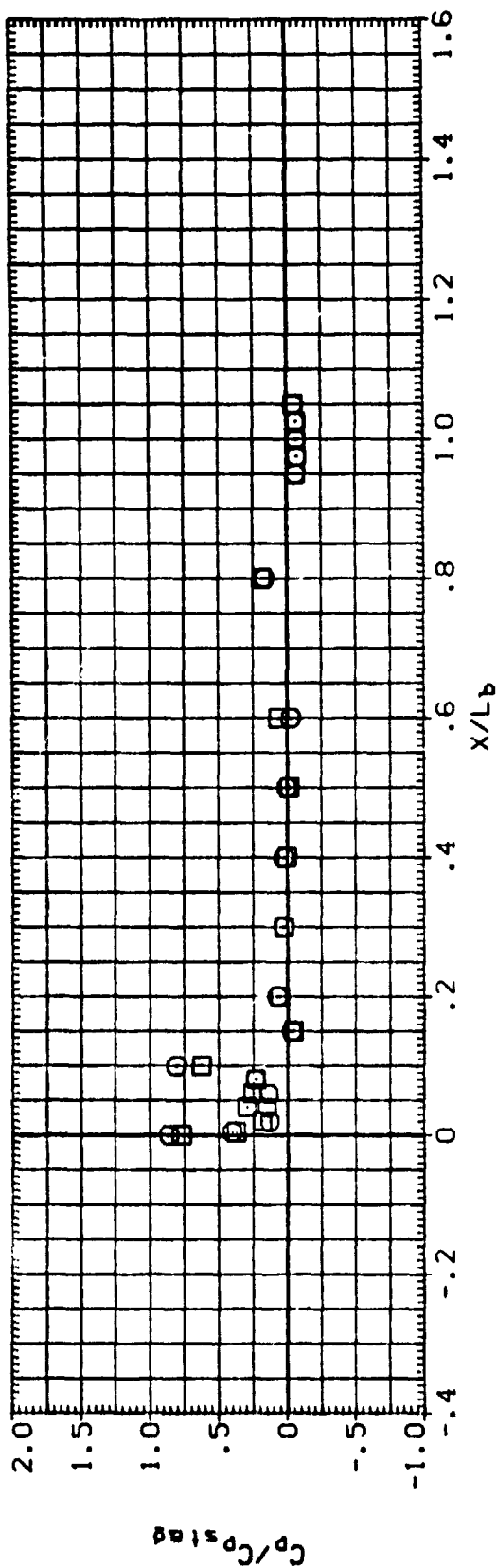


FIG. 22 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 5.0

[RQ3BAC] UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA PHI MACH
 8 5.000 180.000 2.950
 122.700

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

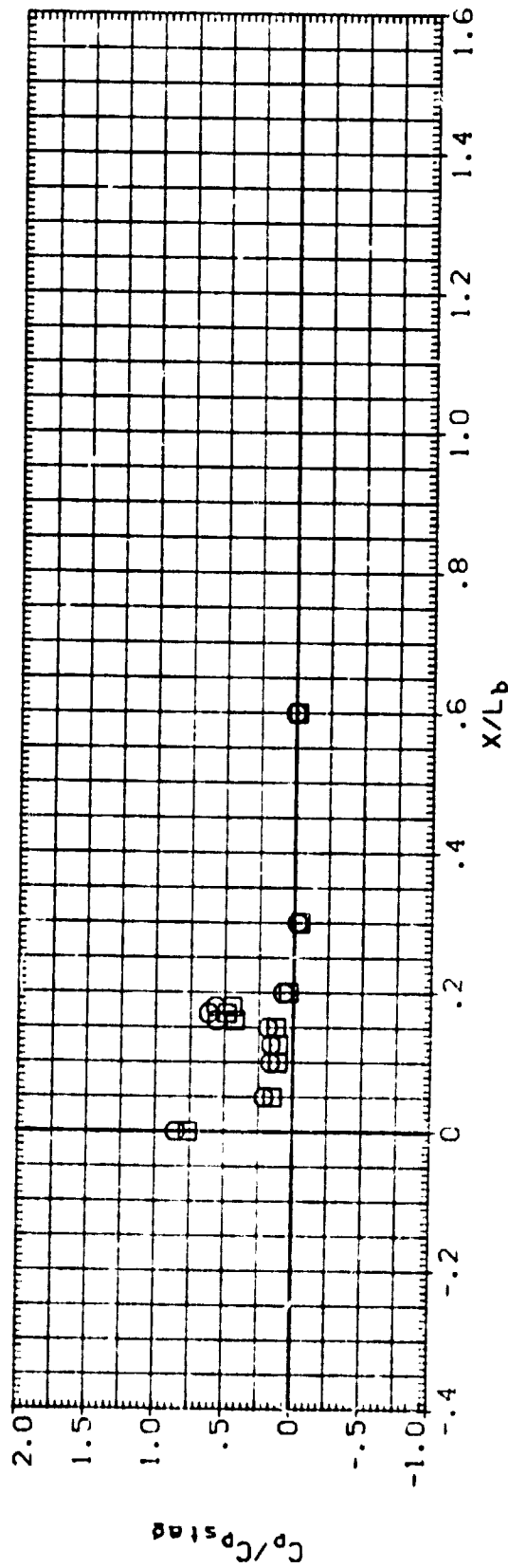
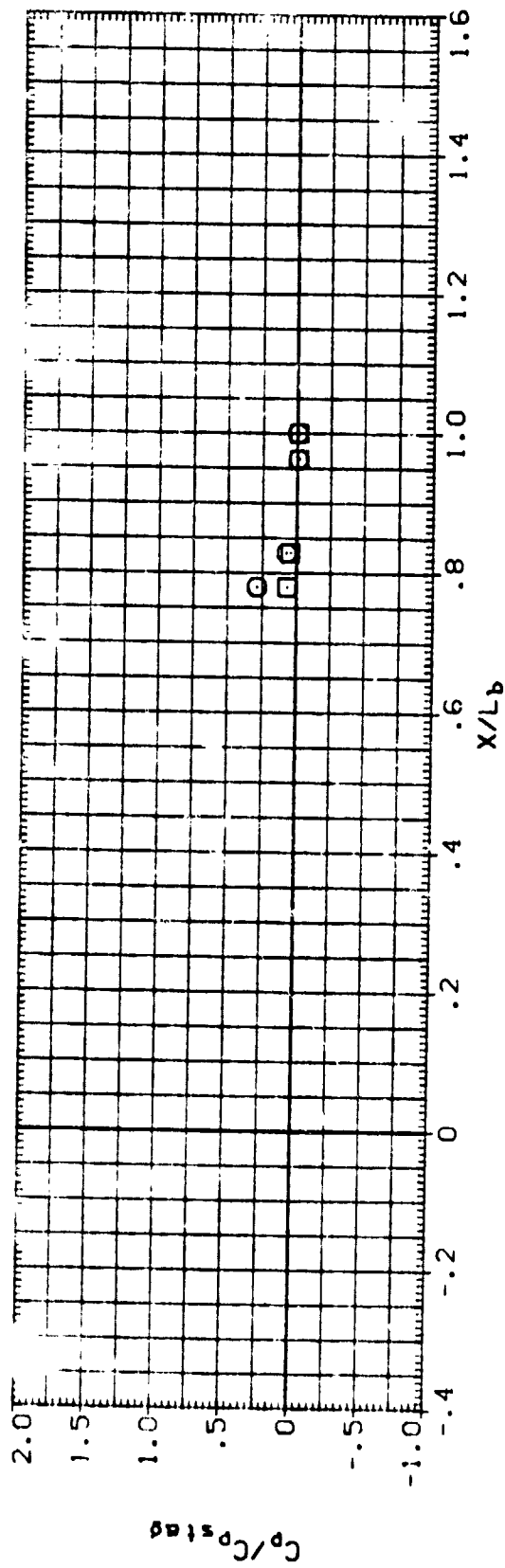


FIG. 22 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 5.0

(R038AC) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	95.000	3.700	5.000	BETA
	.000	.000			.000

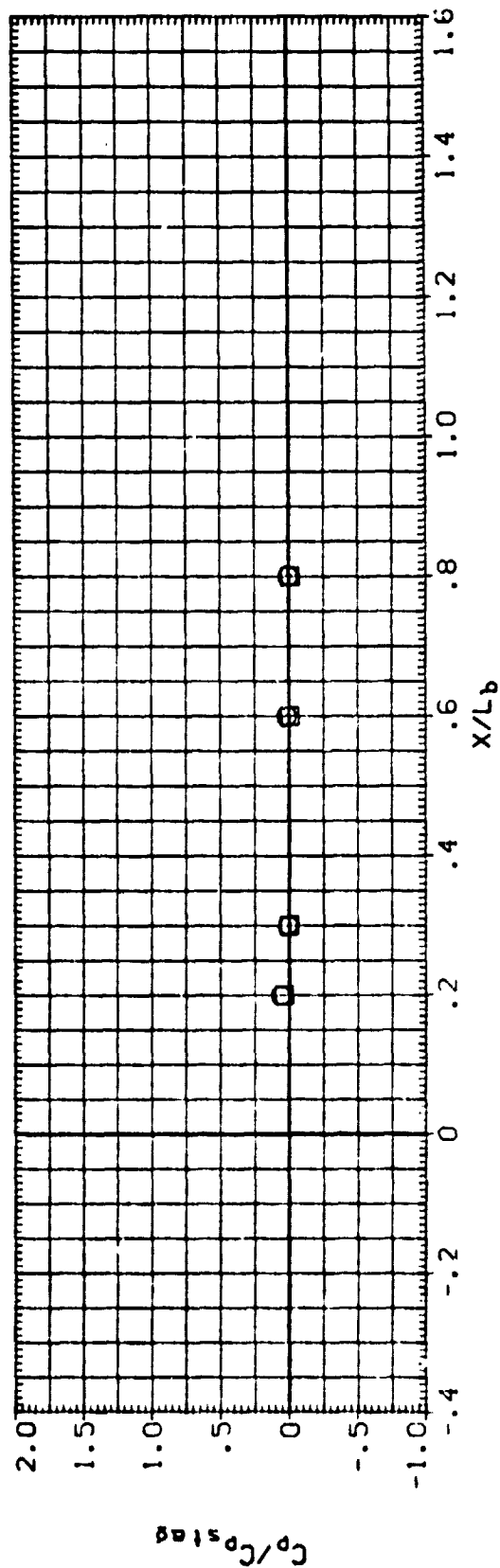
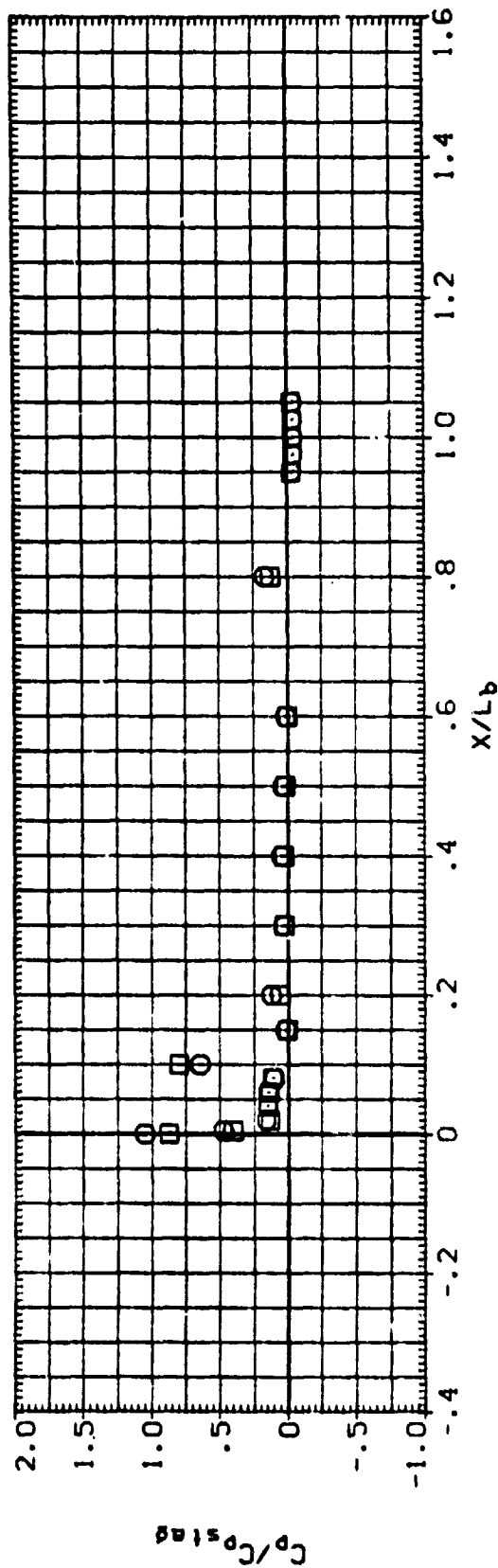


FIG. 22 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 5.0

SYMBOL ALPHA PHI MACH
 -5.000 180.000 3.700
 .000 122.700

PARAMETRIC VALUES
 5.000 BETA .000

RN/L

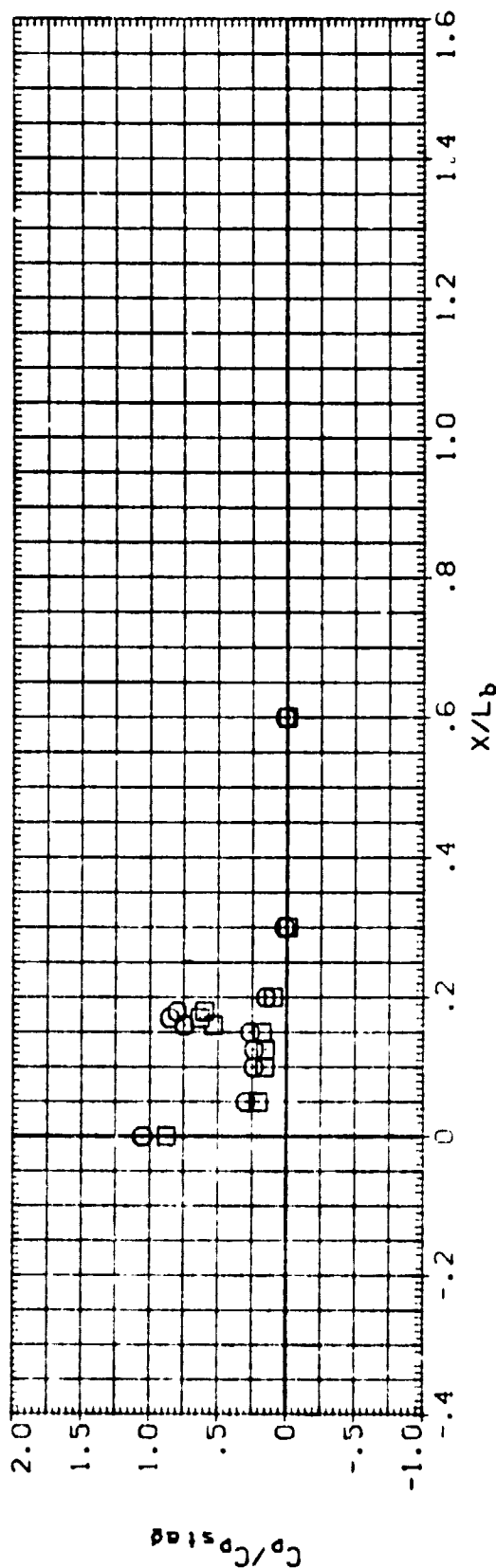
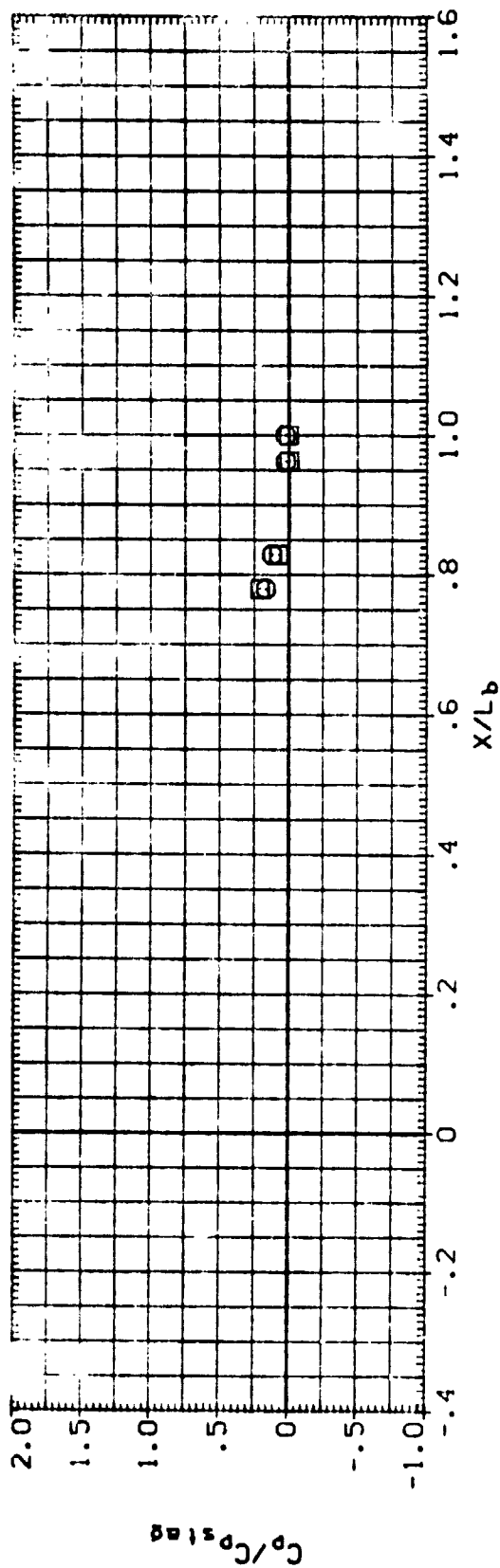


FIG. 22 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 5.0

(R038AC) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	95.000	4.600	5.000	BETA .000

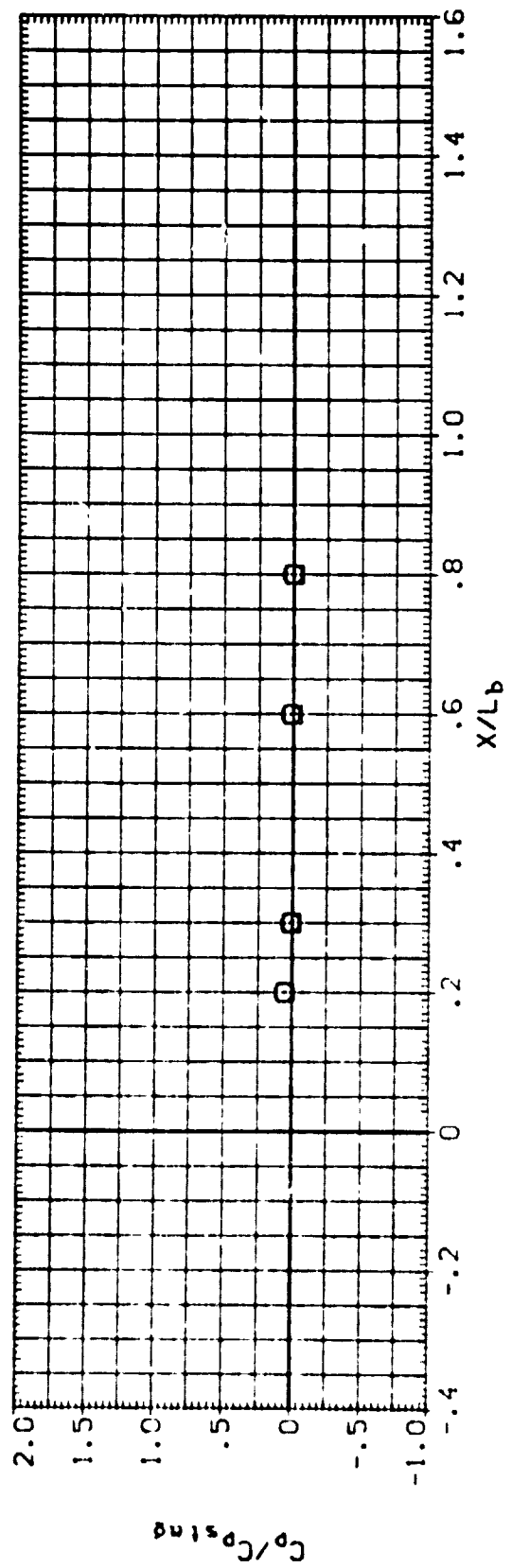
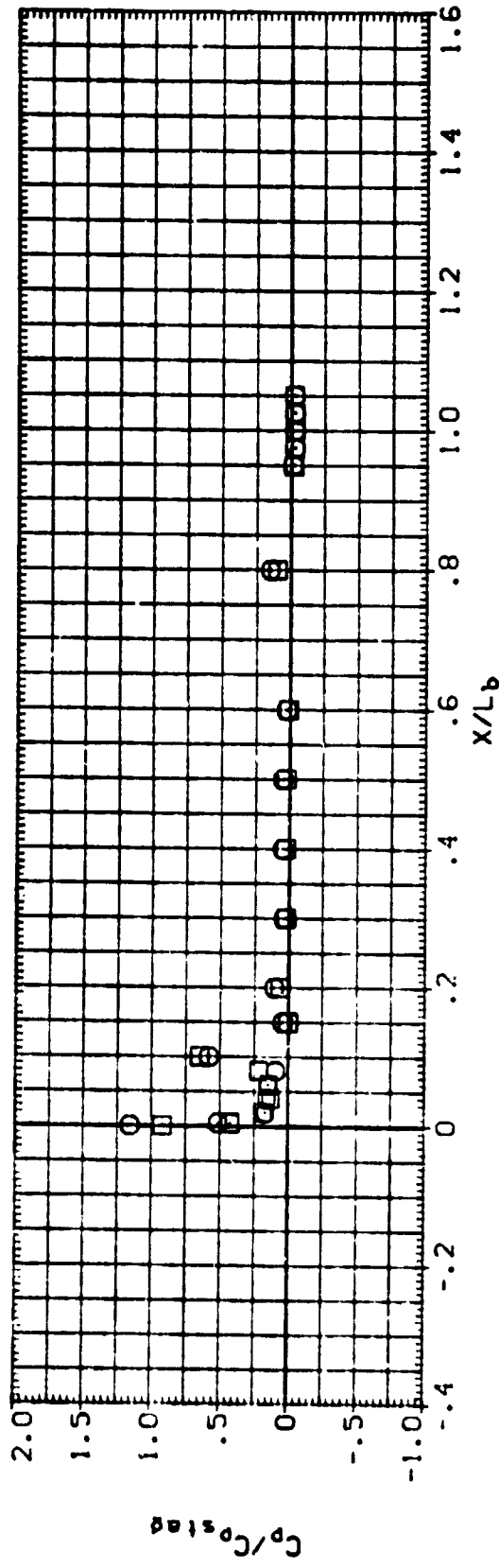


FIG. 22 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 5.0

SYNOPSIS
 ALPHA PHJ
 160.000
 122.700

PARAMETRIC VALUES
 5.000
 BETA
 .000

RN/L

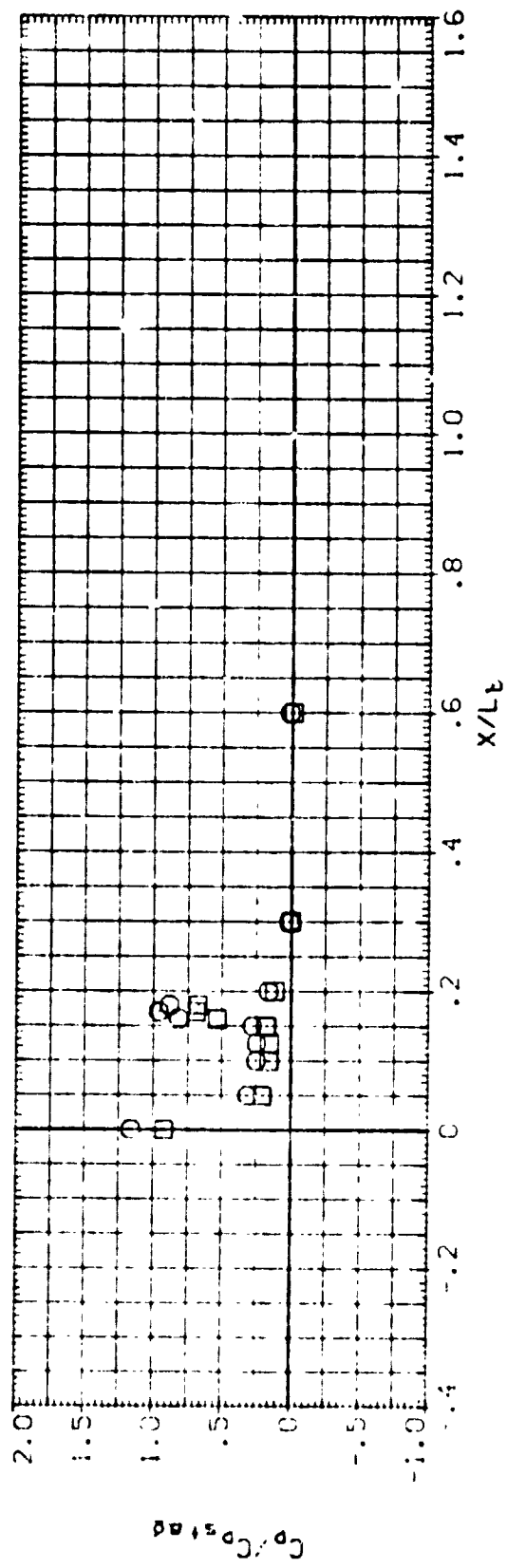
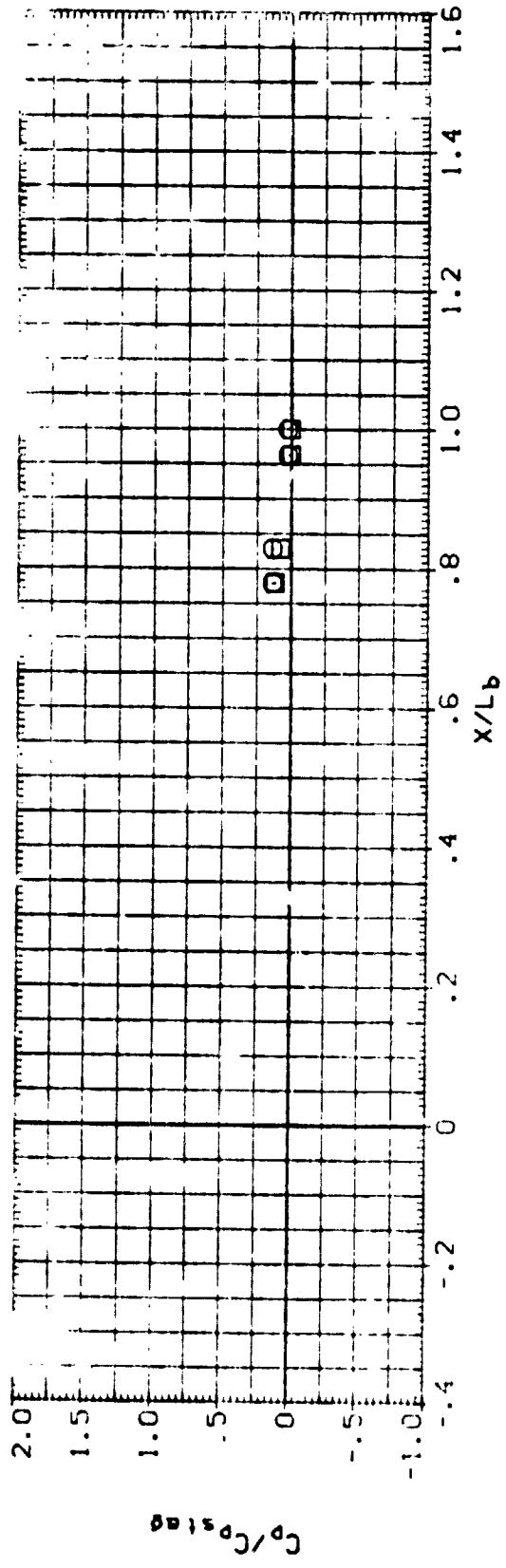


FIG. 22 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA = 0. $RN/L = 5.0$

[R03BAC] UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
□	0.000	.200	2.950		5.000 BETA
○	5.000	.100			.000

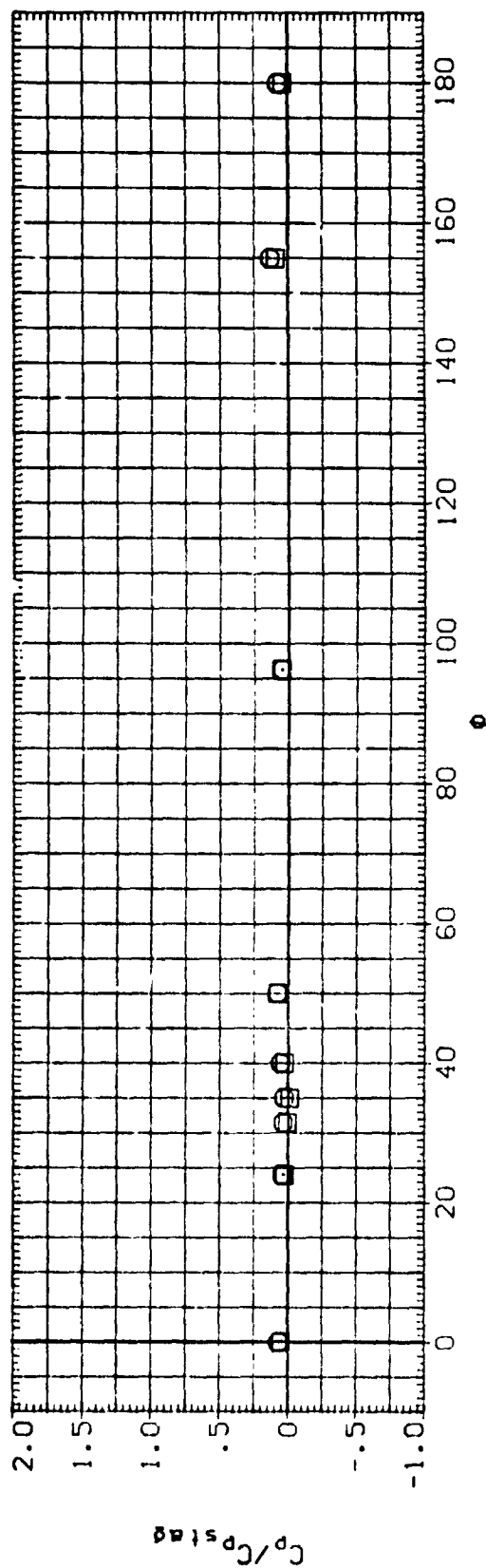
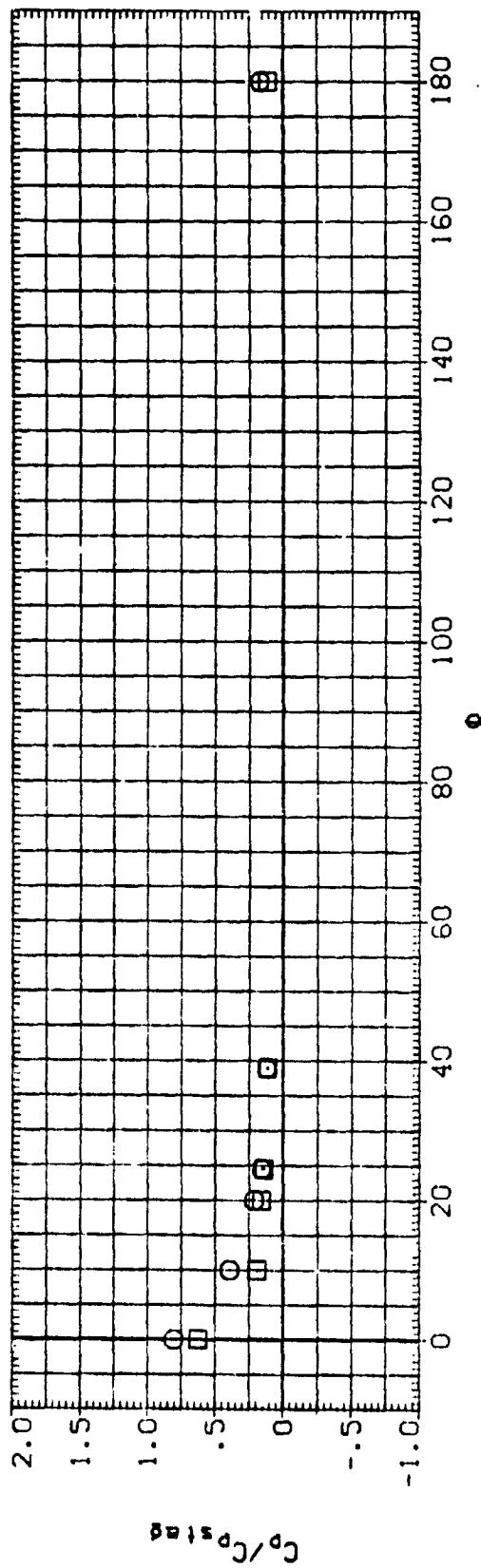


FIG. 22 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. $BETA = 0$. $RN/L = 5.0$ PAGE 277

(RQ3BAC) ALP
SYMBOL

UPWT 1	X/LB
ALPHA	
.000	.600
5.000	.300

CIH4
MACH
2.950

01-T15-S8N16

ORBITER FUSELAGE

PARAMETRIC VALUES	
5.000	BETA .000

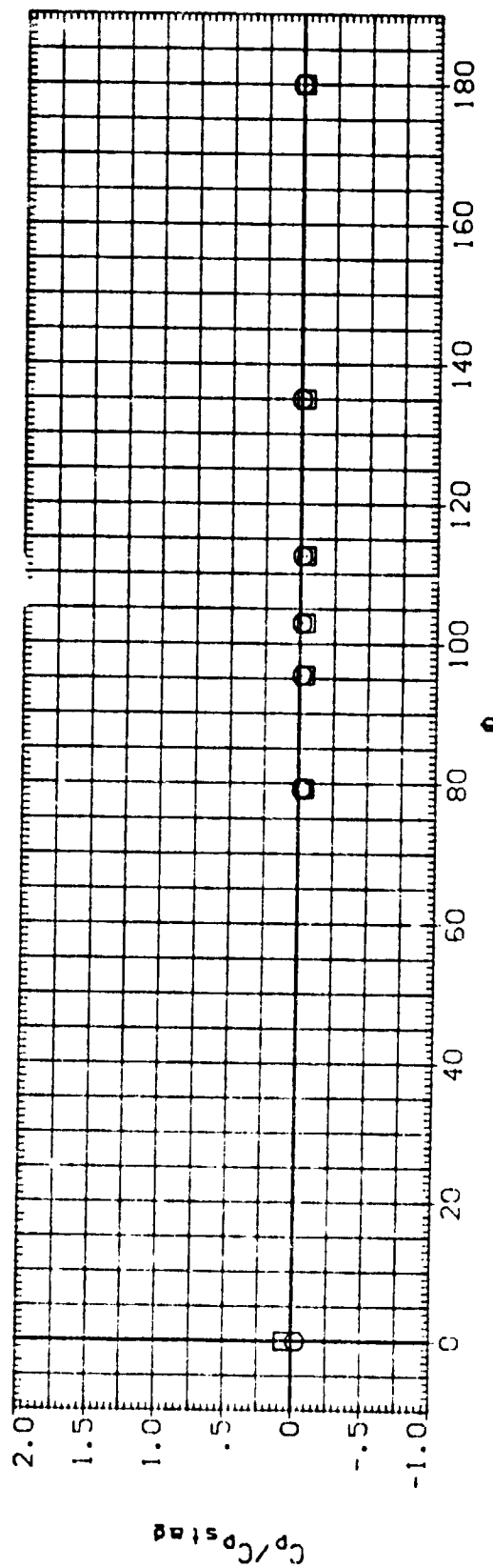
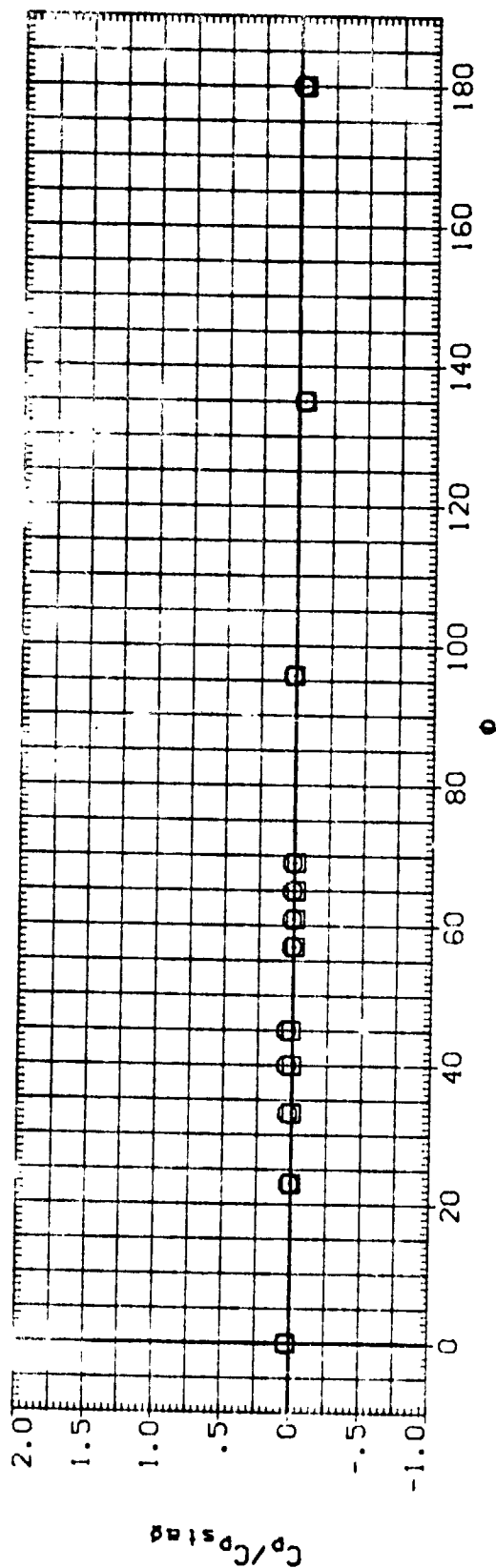


FIG. 22 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 5.0

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

(R03BAC) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.200	3.700	5.000	BETA .000
□	.000	.100			

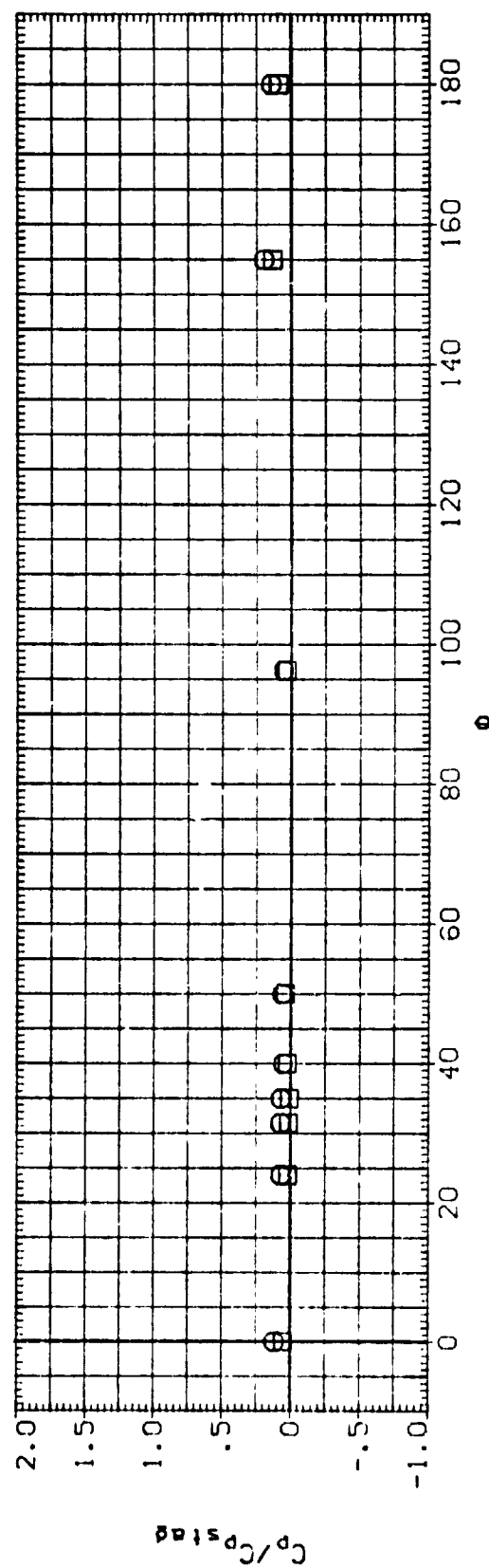
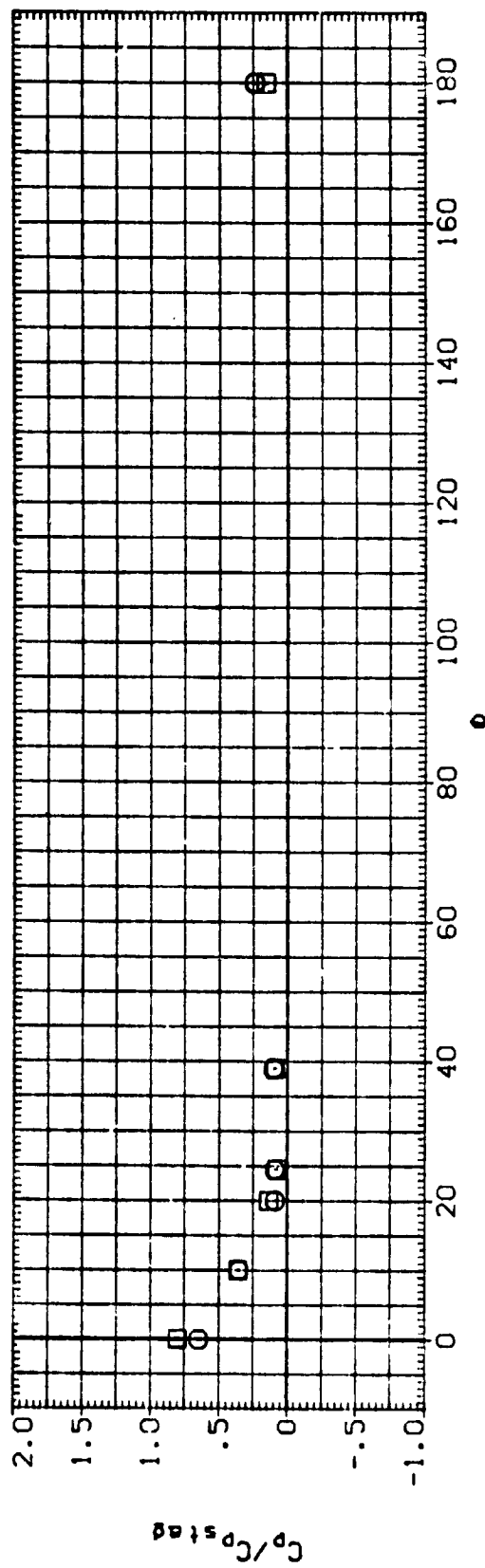


FIG. 22 VARIATION OF C_p/C_{pstag} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 5.0

(R03BAC) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA X/LB MACH
 -5.000 .600 3.700
 .000 .300

PARAMETRIC VALUES
 5.000 BETA

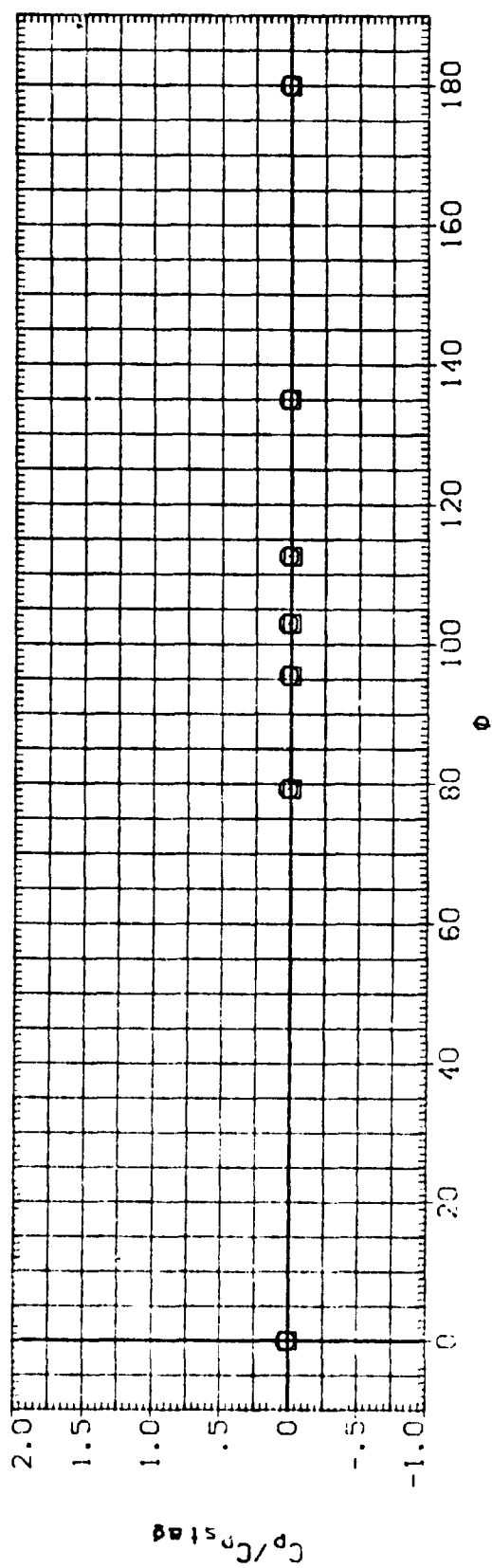
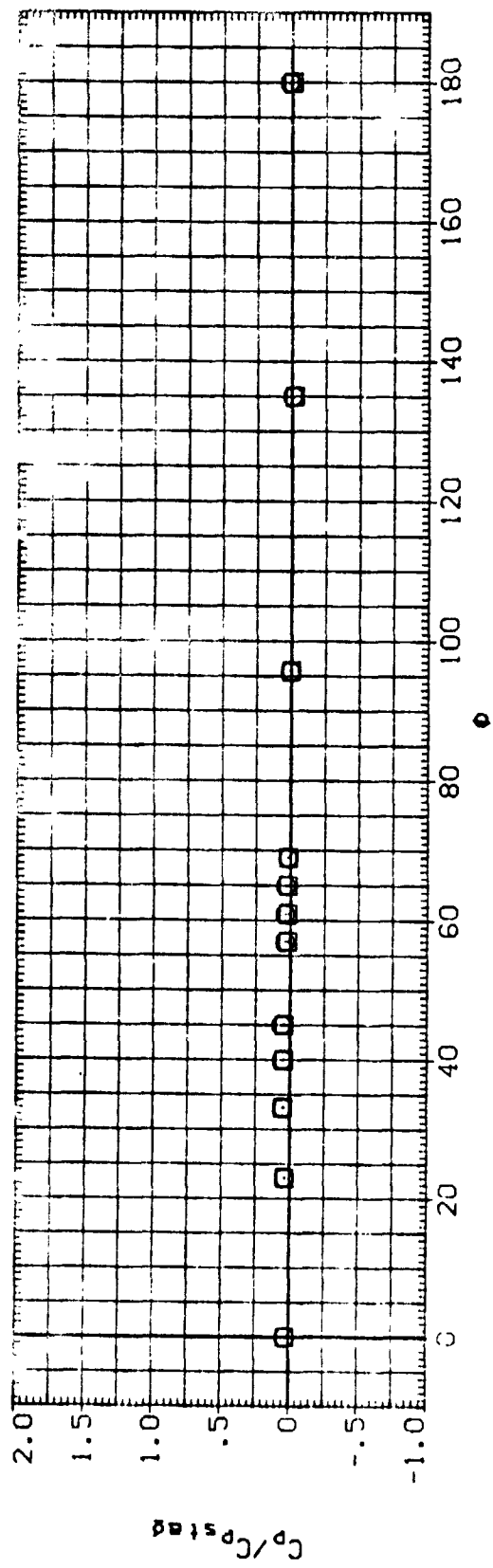


FIG. 22 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 5.0

(R038AC) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.200	4.600	5.000	BETA
□	.000	.100			.000

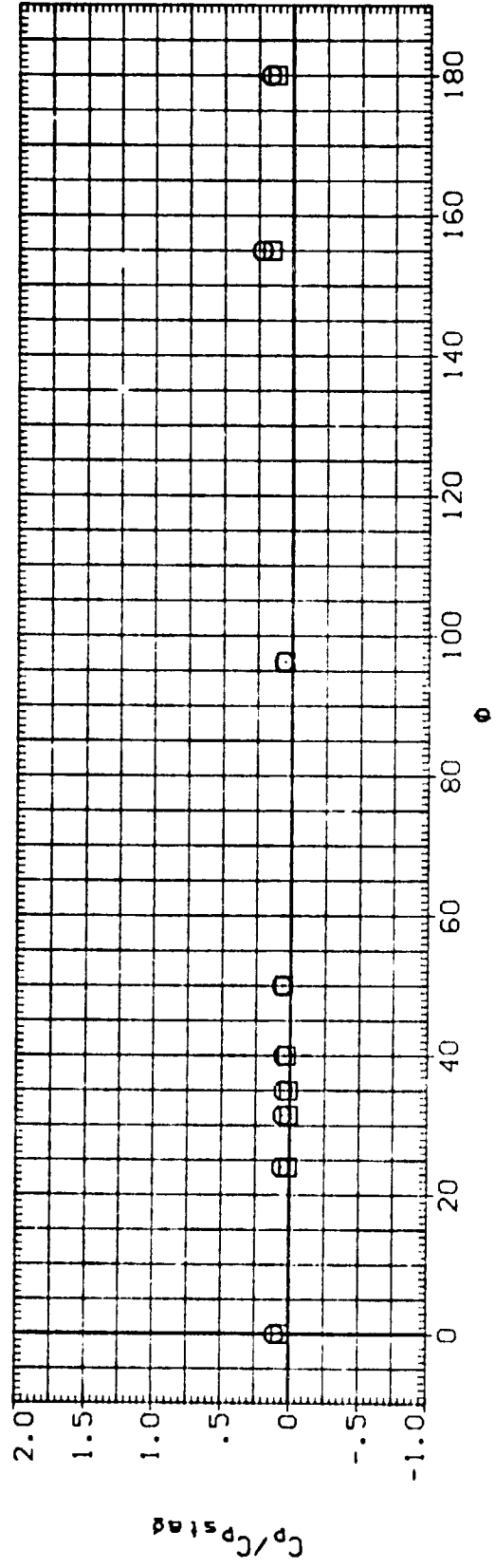
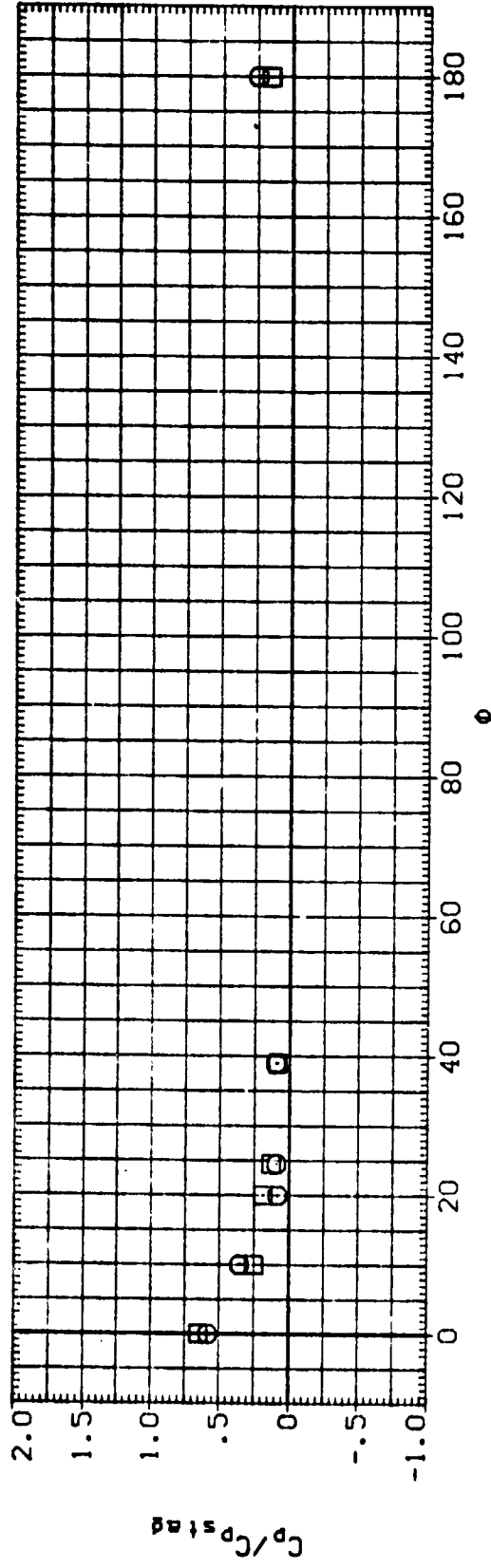


FIG. 22 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 0. RN/L= 5.0

(R03BAC) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	X/LB	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.600	4.600	5.000	BET.
	.000	.300			

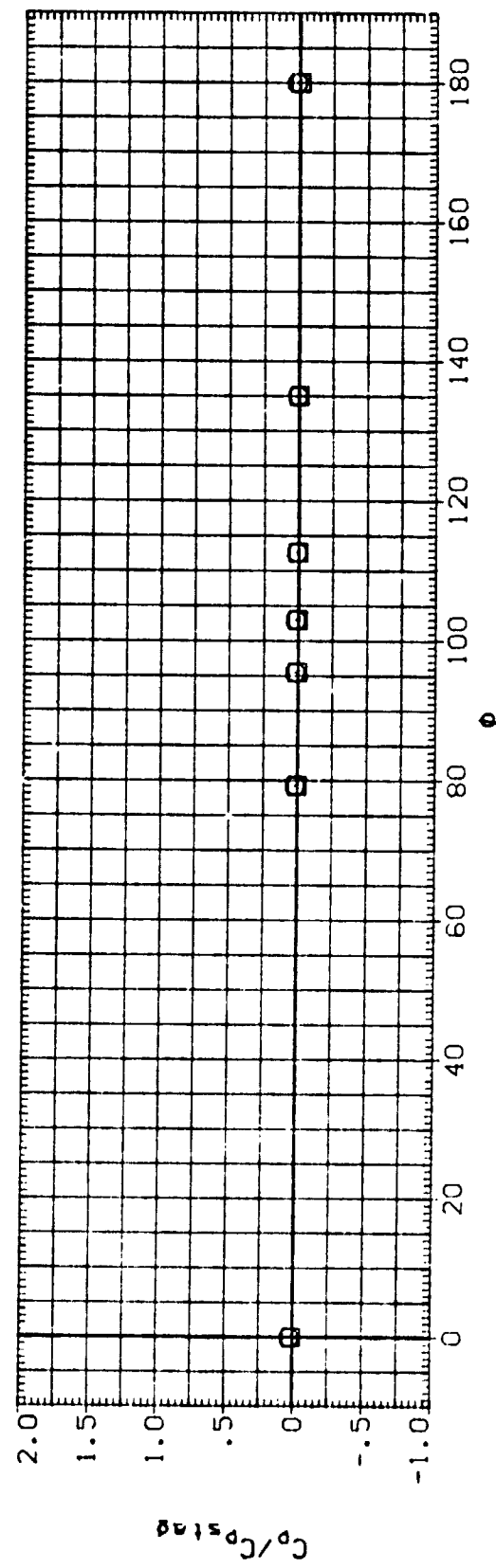
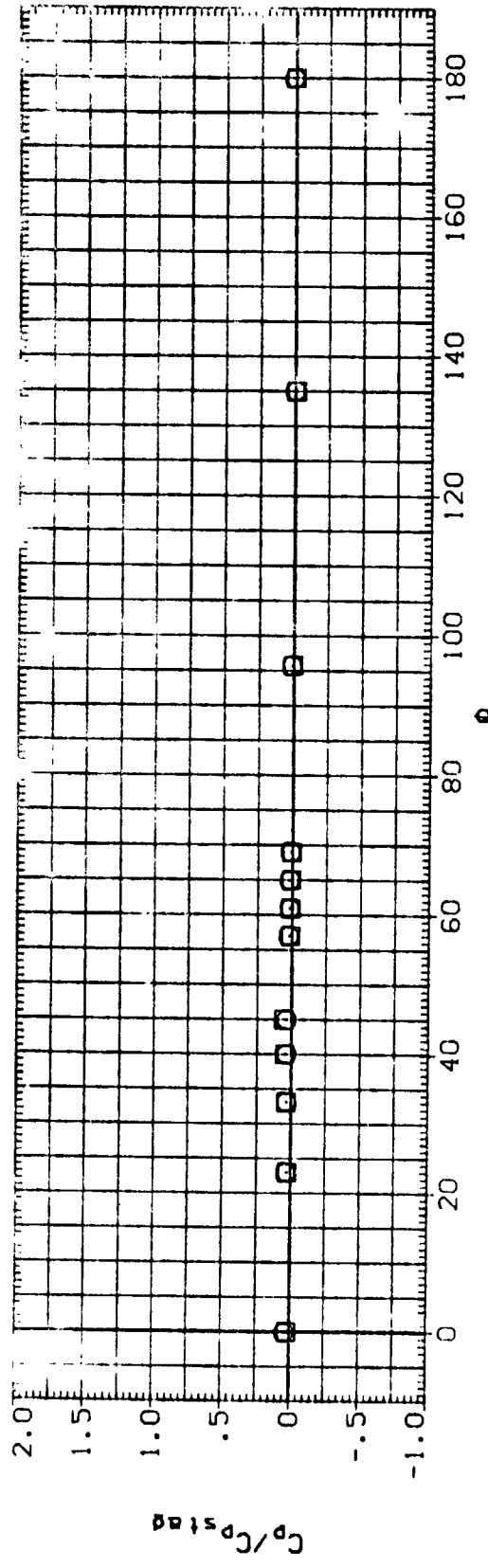


FIG. 22 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. $BETA = 0$. $RN/L = 5.0$

[R03LAC] UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2Y/BN	MACH	RN/L	PARAMETRIC VALUES
□	.000	.400	2.950		5.000 BETA
○	5.000	.250			.000

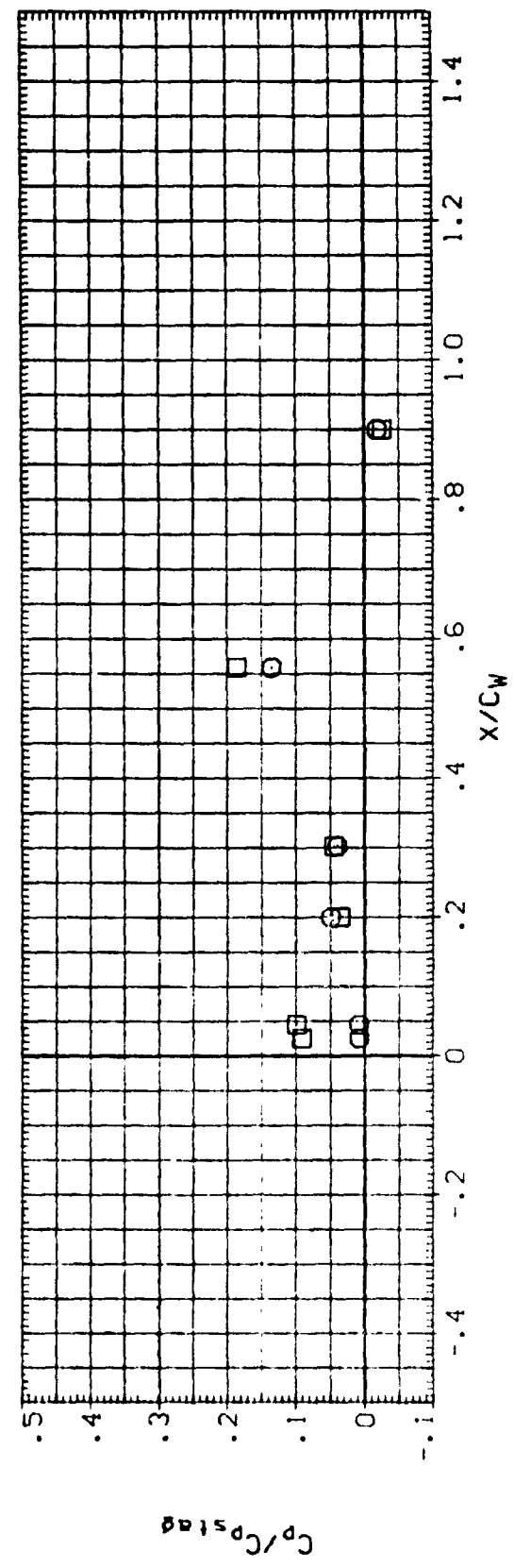
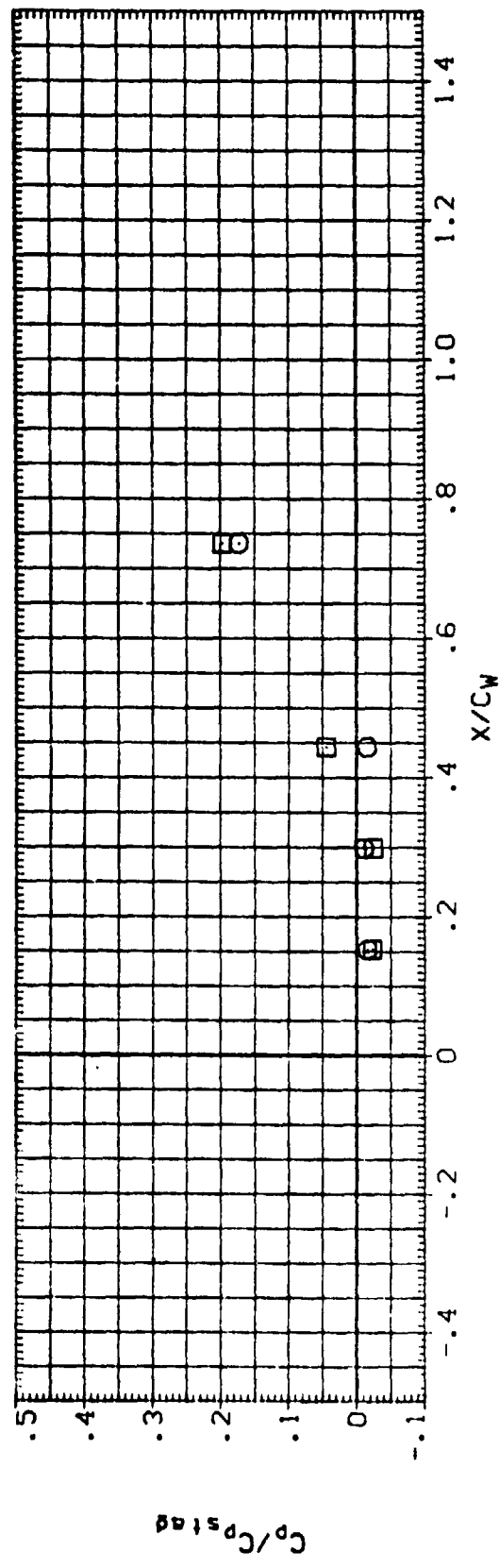


FIG. 23 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 5.0

[R03LAC] UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/BV MACH
 5.000 .000 2.950

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

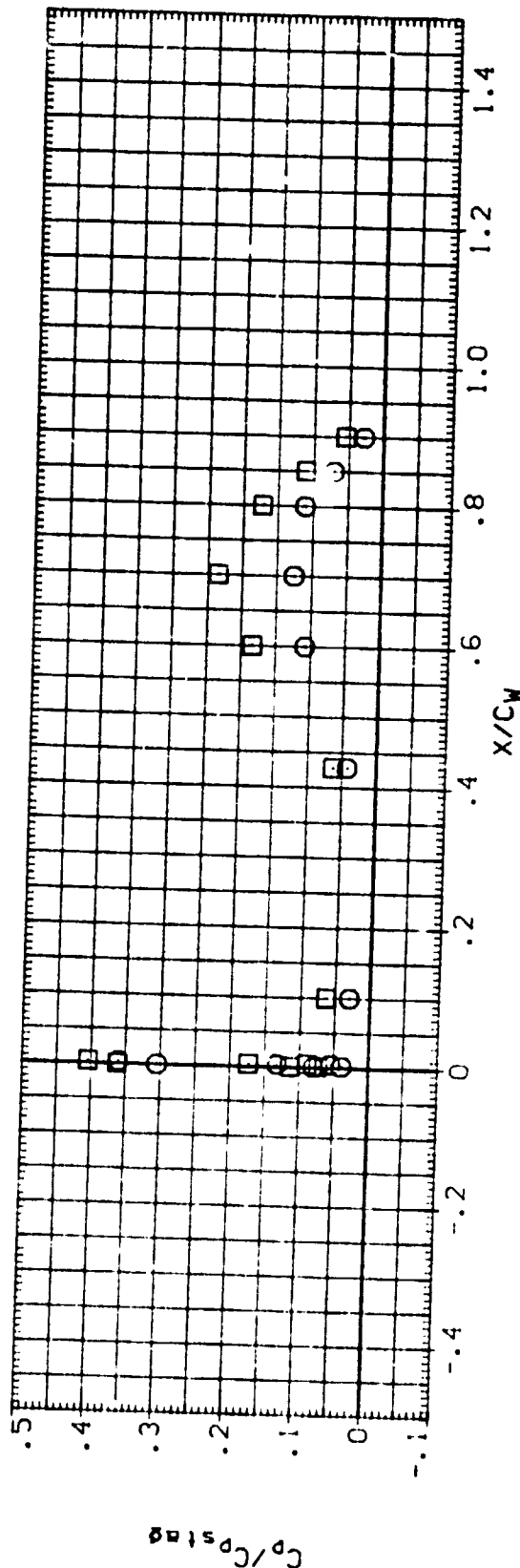
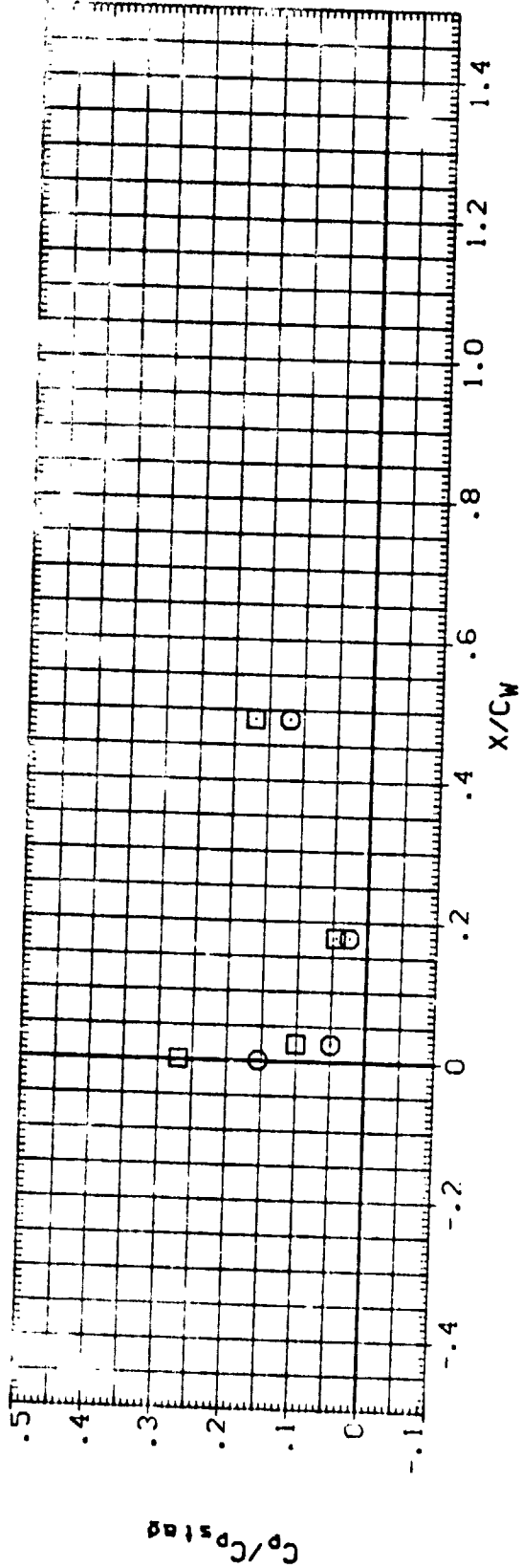


FIG. 23 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 5.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(RQ3LAC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

PARAMETRIC VALUES
5.000 BETA .000

RN/L

SYMBOL ALPHA .000
5.000
2Y/BV .850
MACH 2.950

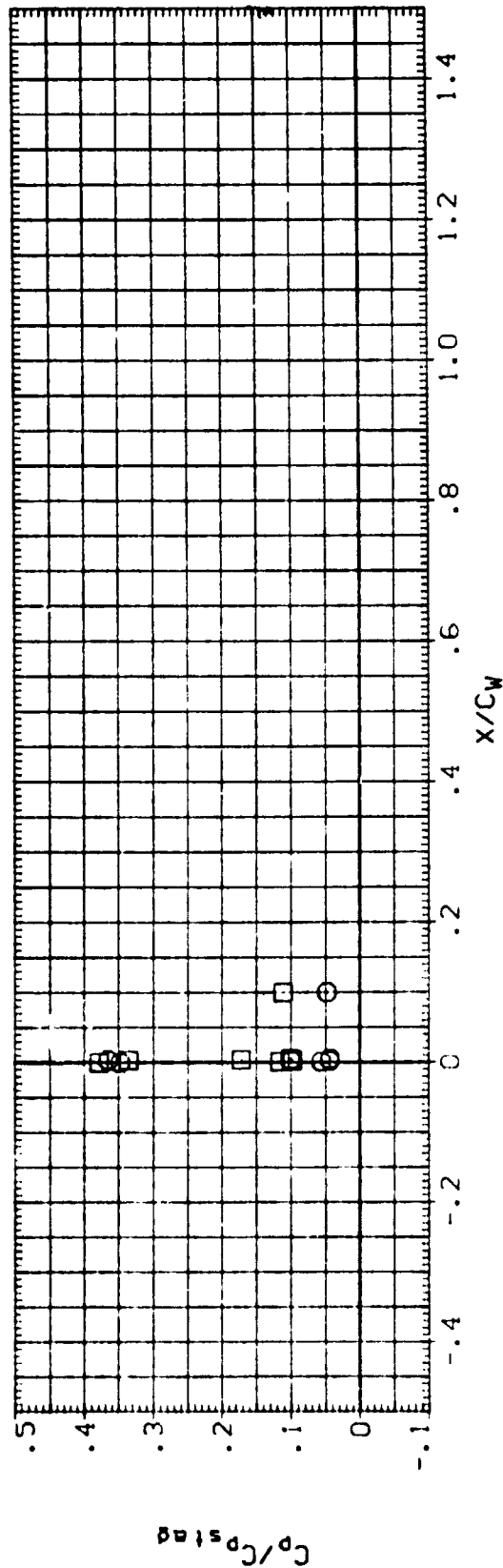
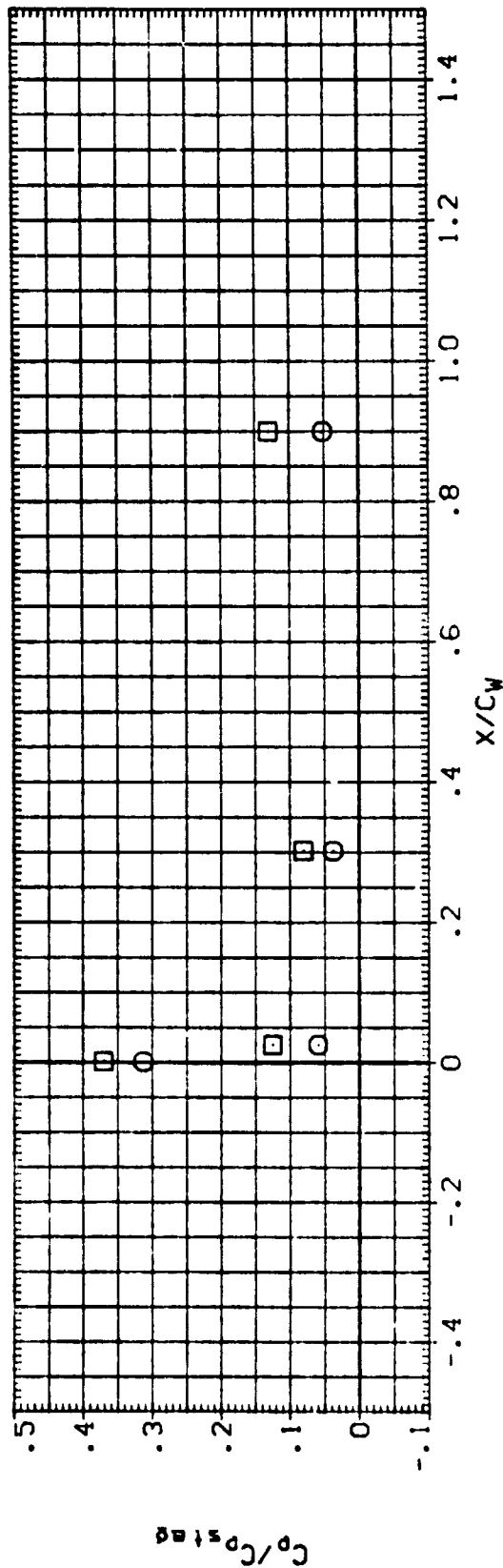


FIG. 23 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, ORBITER LOWER WING, BETA= 0, RN/L= 5.0

(R03LAC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYNTH. A. 2Y/B. MACH
-5.000 .400 3.700
□ .250

PARAMETRIC VALUES
5.000 BETA .0000

RN/L

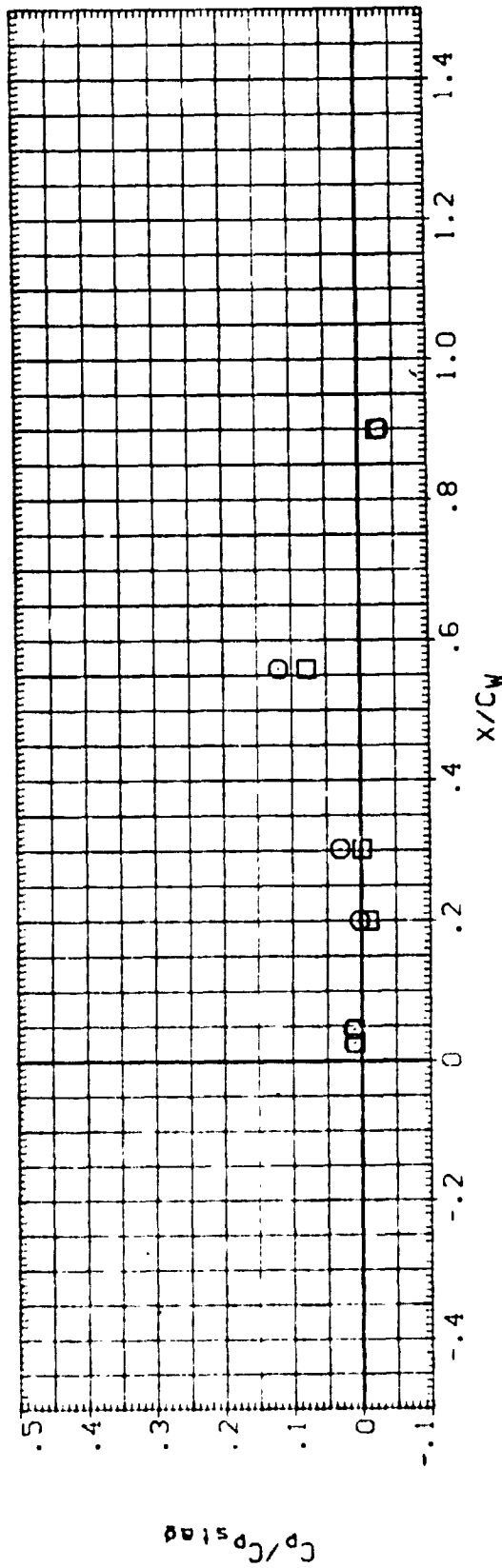
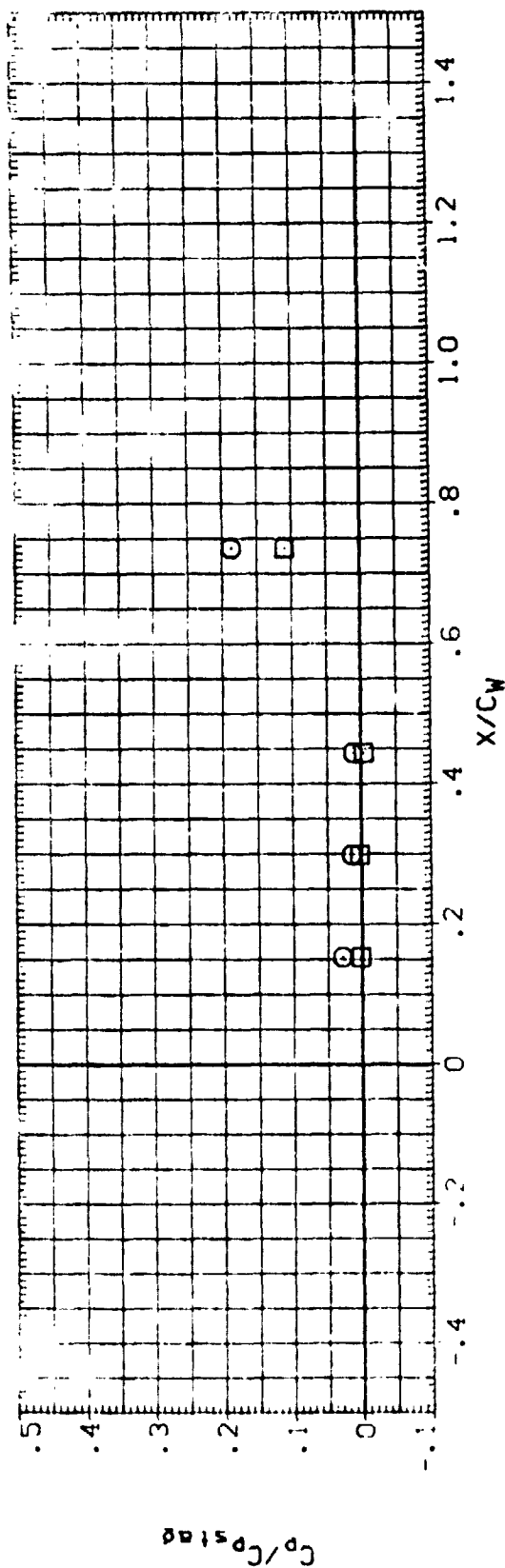


FIG. 23 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 5.0

(R03LAC) UPWT 1059 (IH4) C1-T15-S8N16 ORB. LOWER WING

SYNBO ALPHA 2Y/8V MACH
 -5.000 .600 3.700
 .000 .500

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

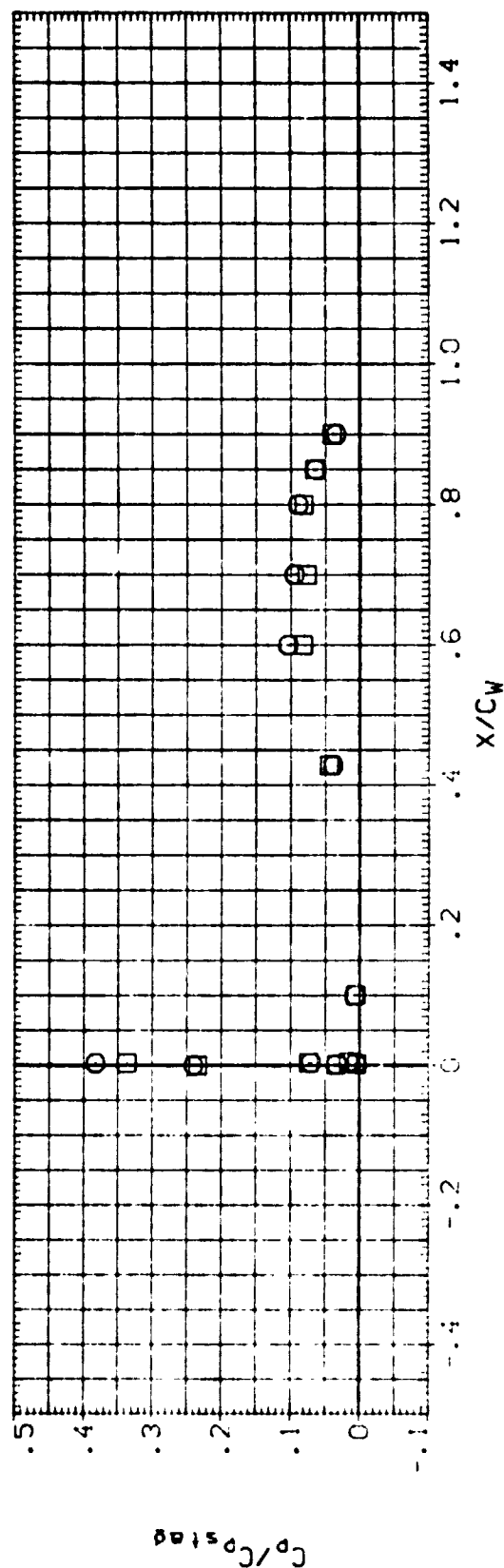
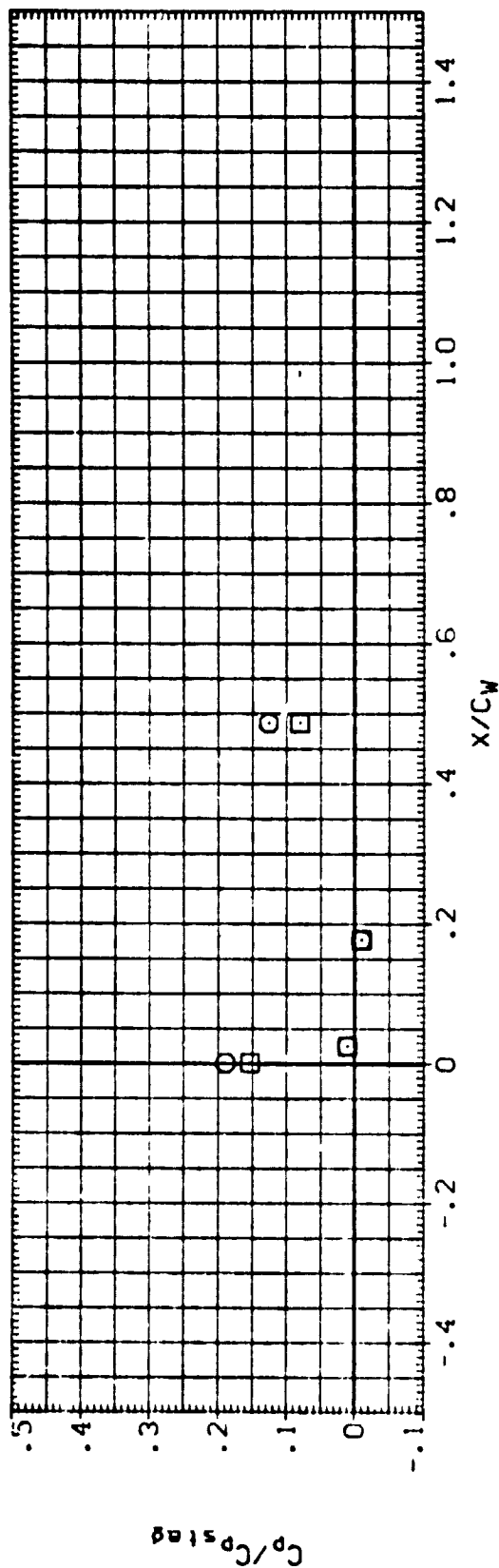


FIG. 23 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 5.0

(RQ3LAC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA
-5.000
.000

2Y/B# MACH
.850 3.700
.750

PARAMETRIC VALUES
5.000 BETA .000

RN

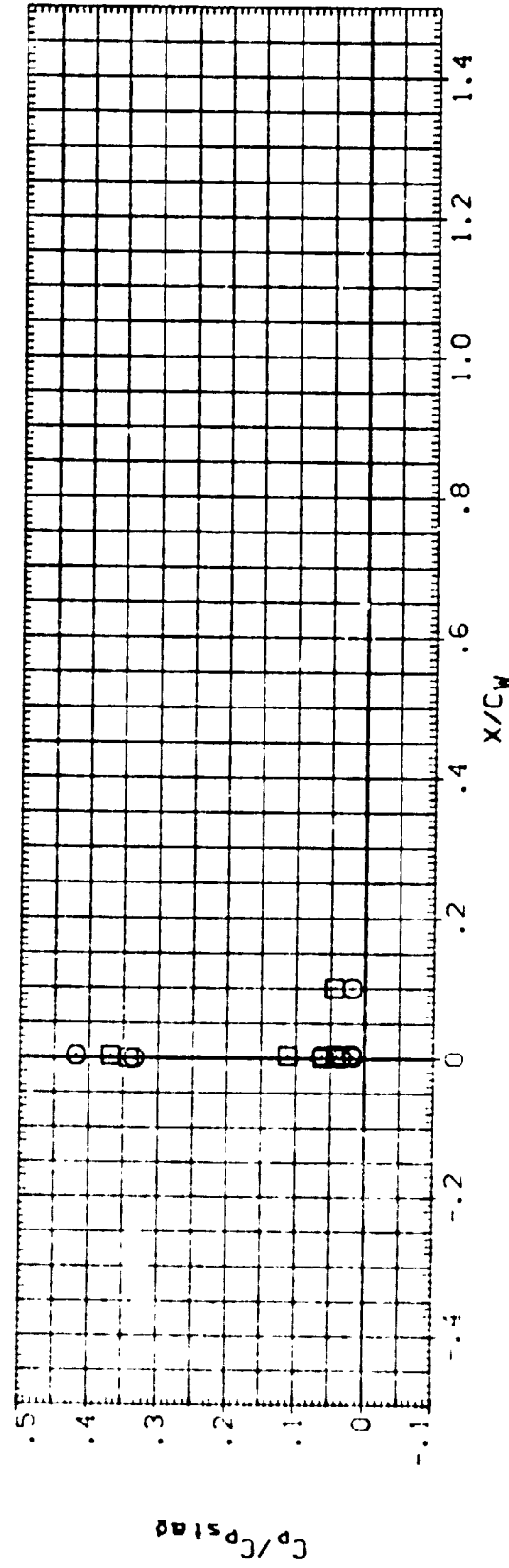
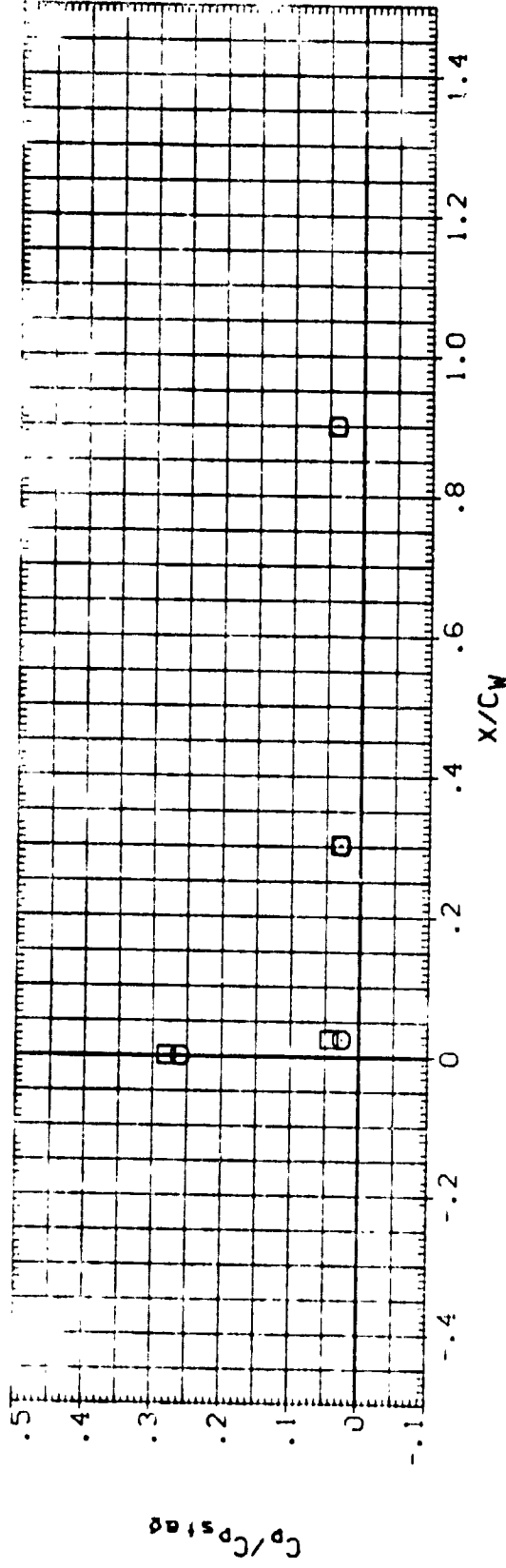


FIG. 23 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 5.0

(R03LAC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

PARAMETRIC VALUES
5.000 BETA .000

RN/L

ALPHA 2°/E 4.60°
SYMBOL -5.000 .400 .200

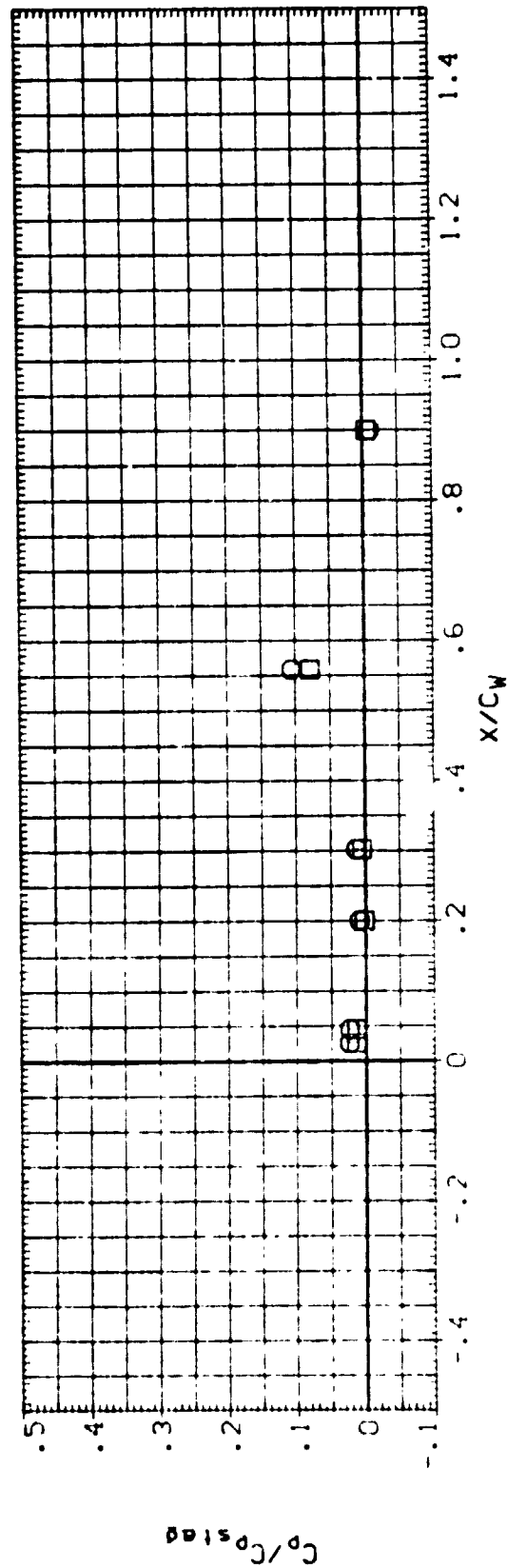
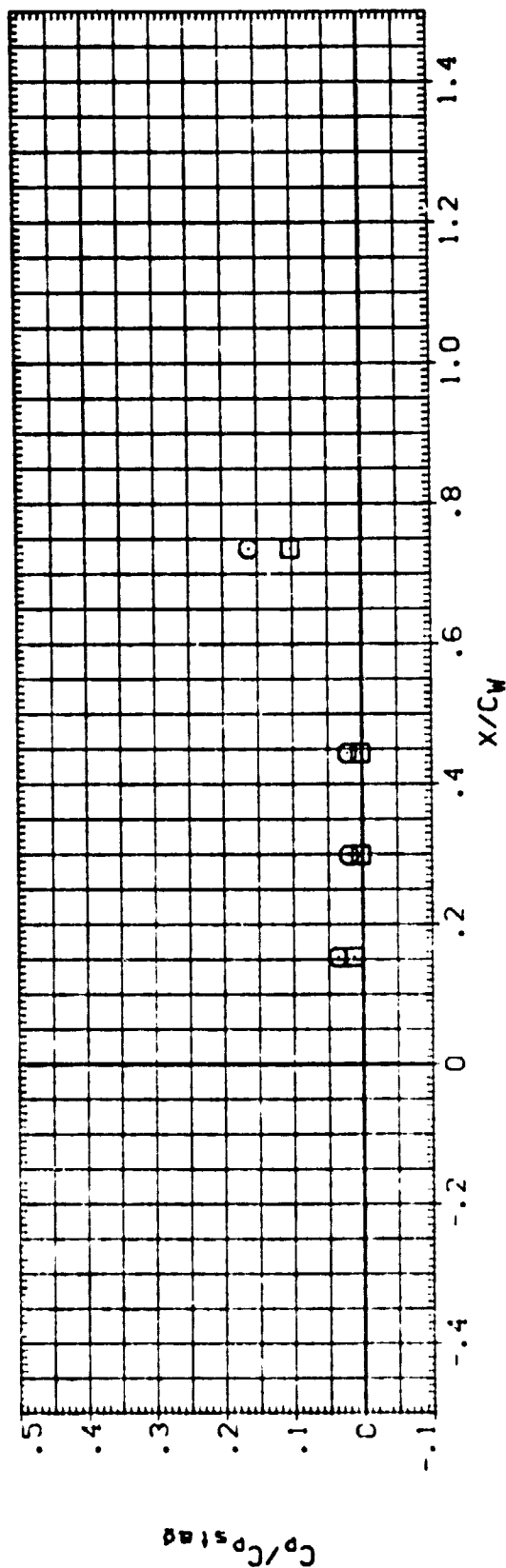


FIG. 23 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 5.0

(R03: AC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/EN MACH
 -5.000 .600 4.500
 .000 .500

RN/L 5.000 BETA .000

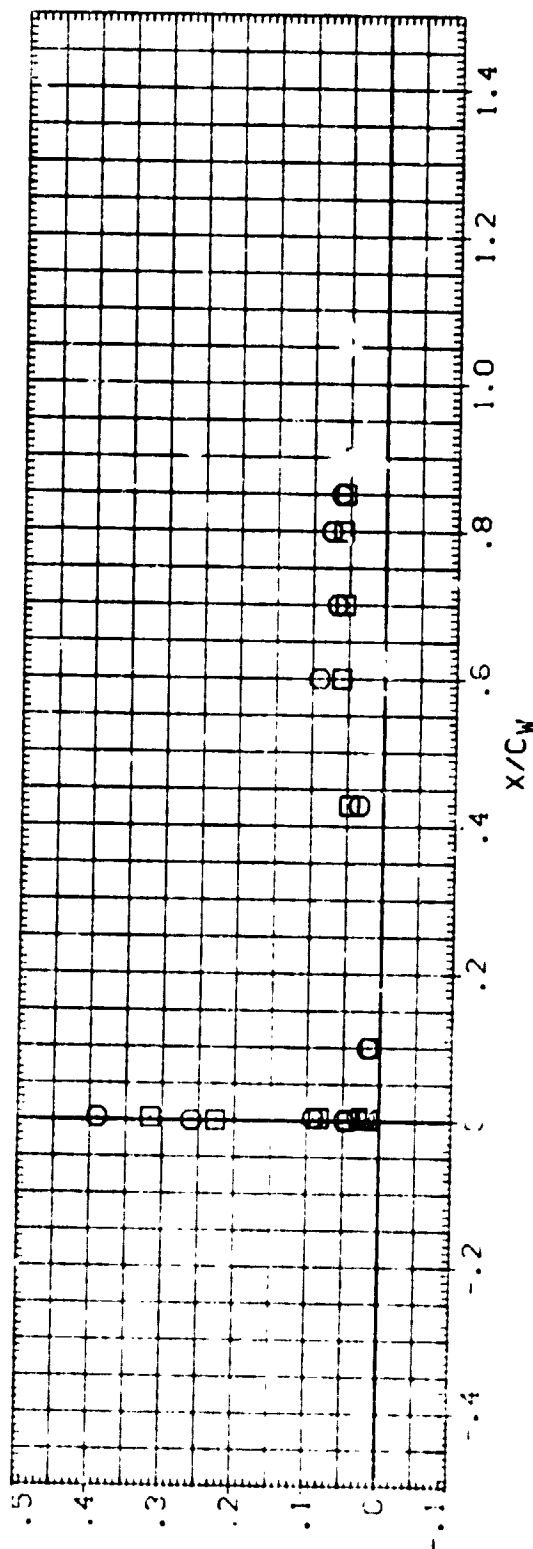
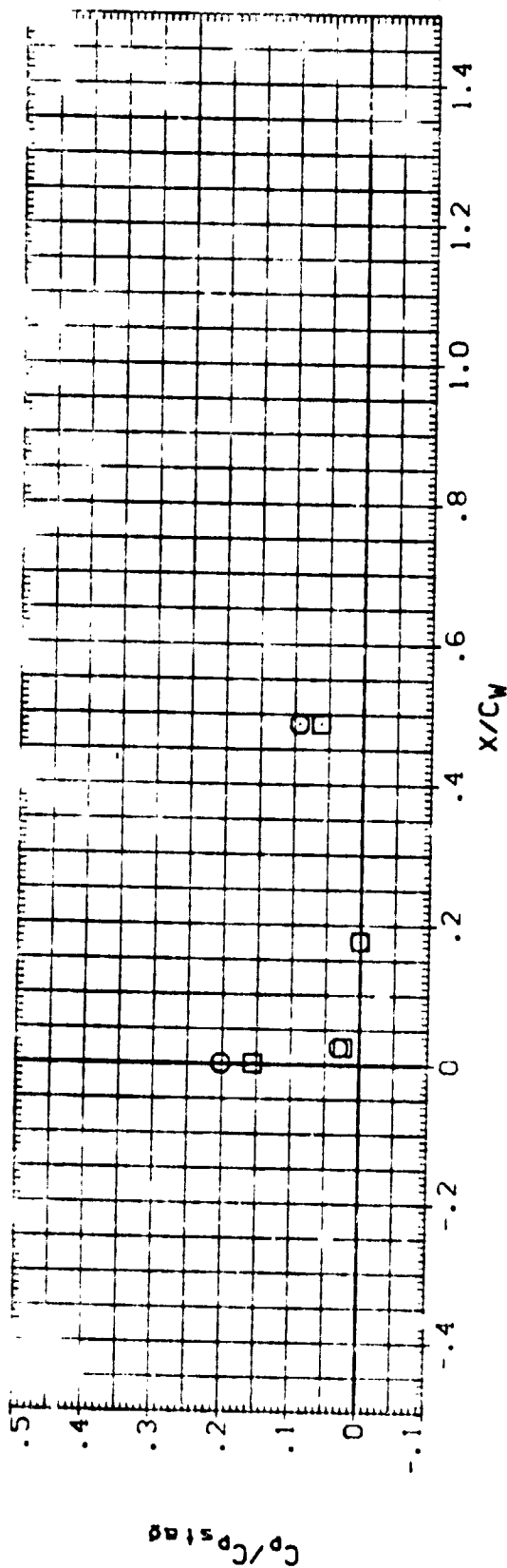


FIG. 23 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 0. RN/L= 5.0

[R03LAC] UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHAL 2Y/BV MACH
 -5.000 .850 4.600
 .000 .750

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

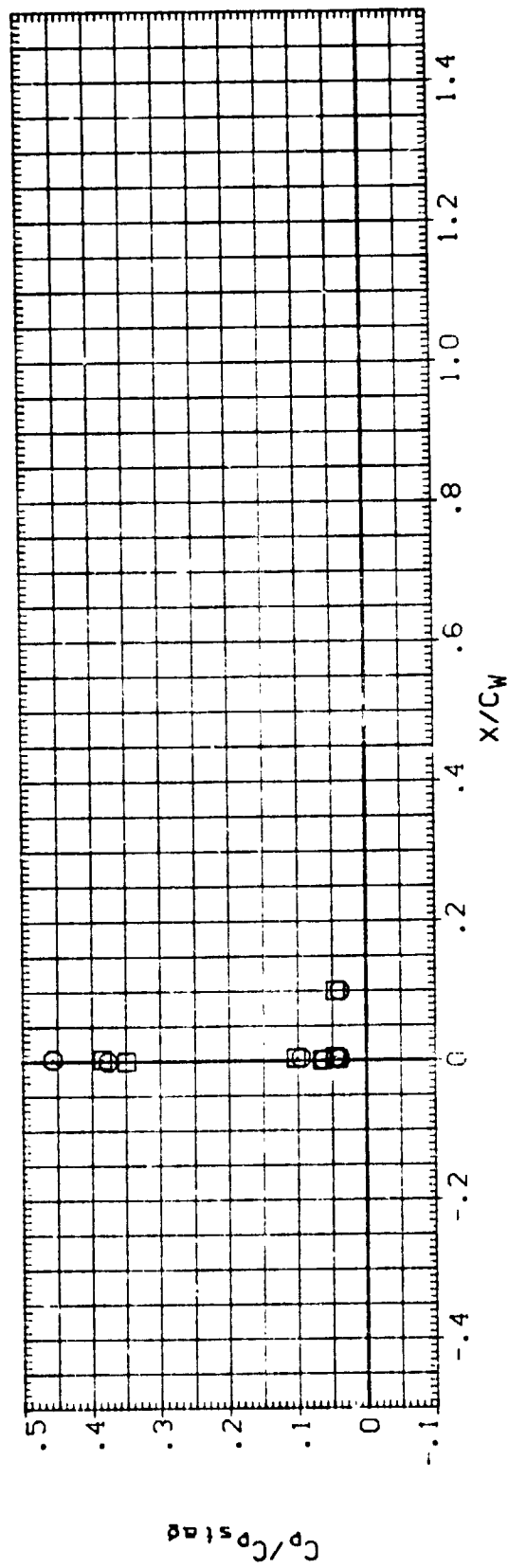
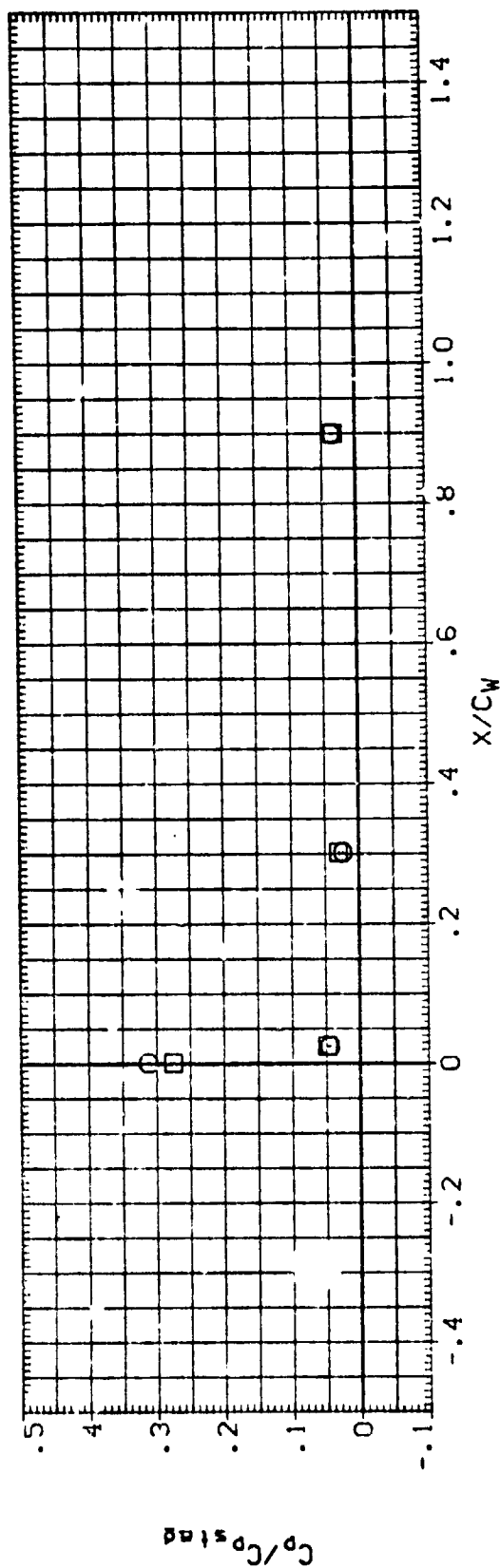


FIG. 23 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER LOWER WING. BETA= 0, RN/L= 5.0

(R03JAC) UPWT 1059 (IH4) 01-T15-S8N1C ORB. UPPER WING

SYMBOL ALPHA 2Y/BY MACH
 5.000 .800 2.97
 5.000 .600
 .400

PARAMETRIC VALUES
 5.000 DELTA
 RN/L

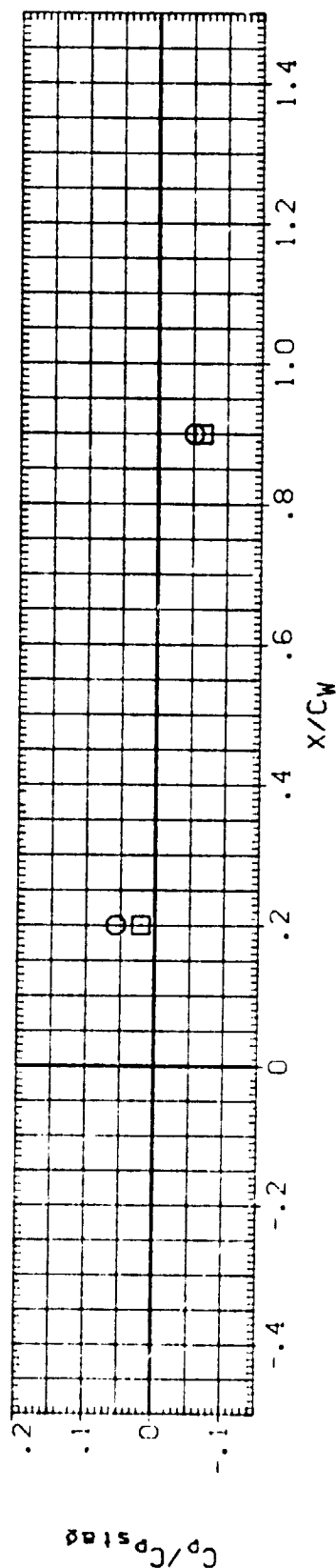
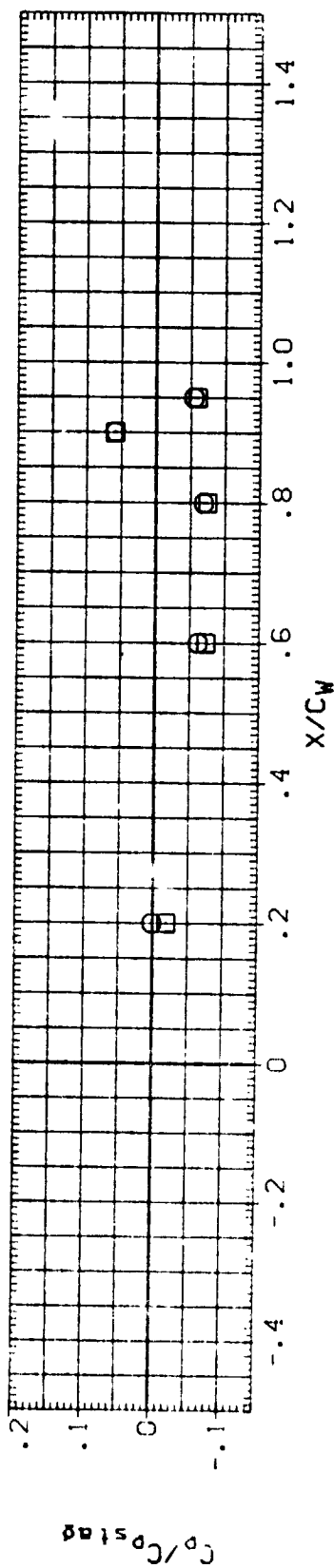
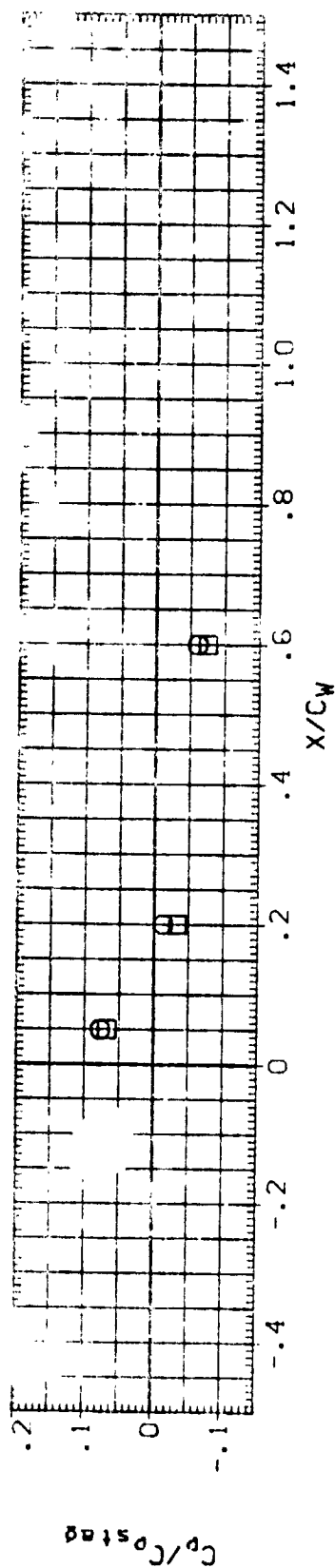


FIG. 24 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER UPPER WING, BETA= 0, RN/L= 5.0

(R03UAC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL	ALPHA	2V/BW	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.800	3.700		5.000 BETA
○	.000	.600			.000
		.400			

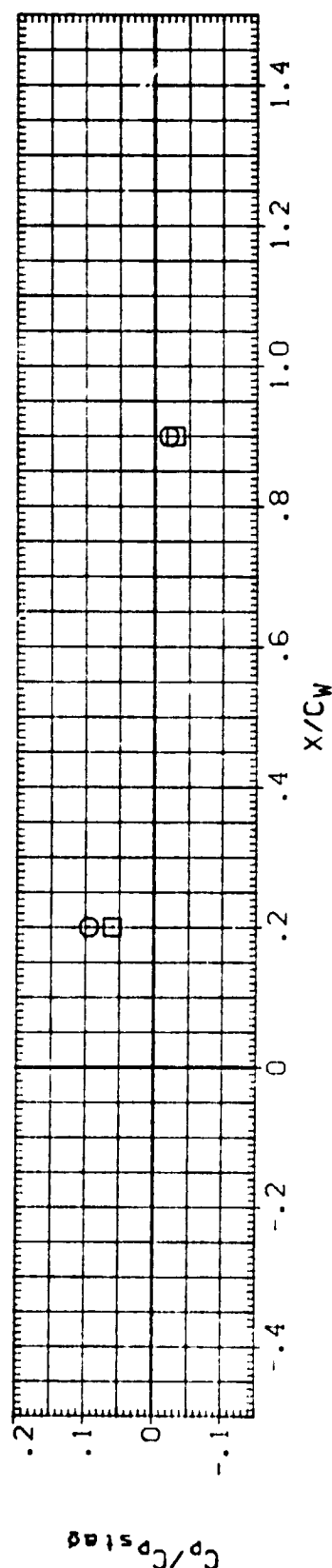
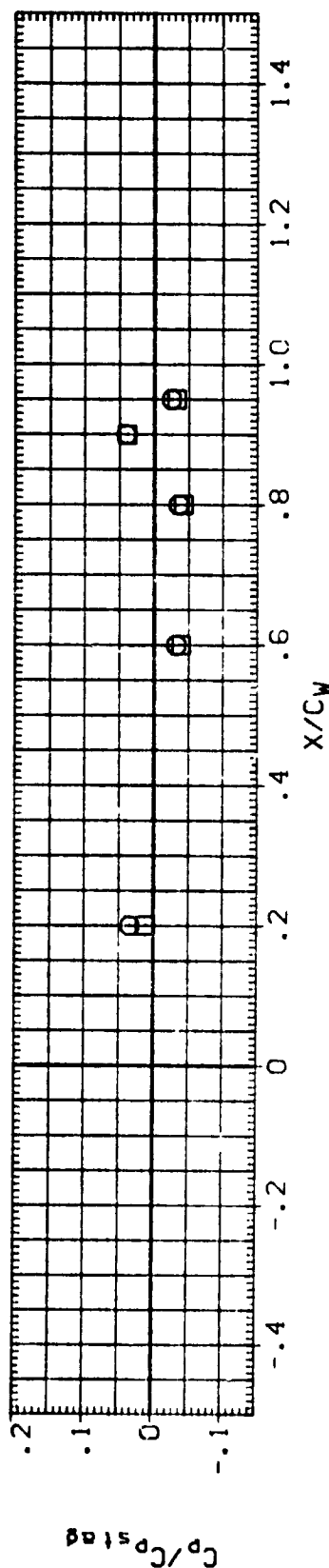
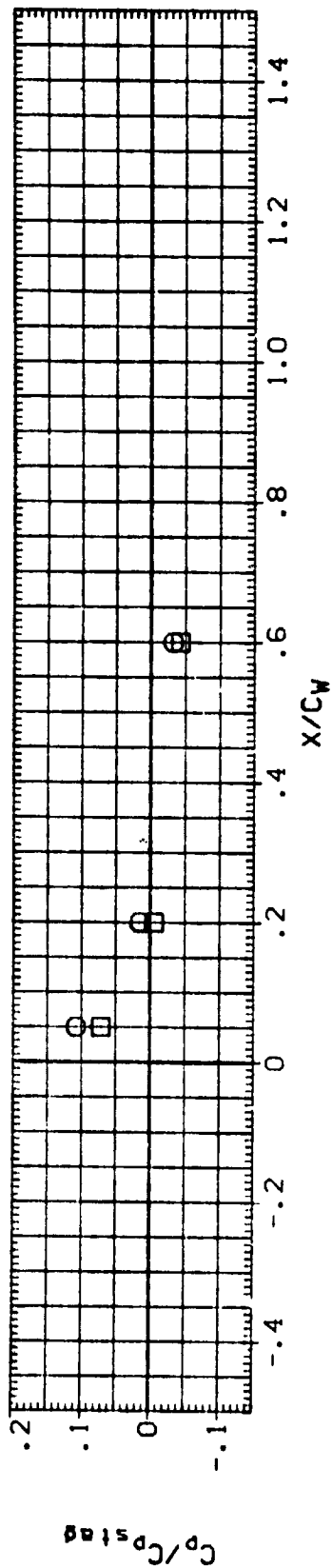


FIG. 24 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING. BETA= 0, RN/L= 5.0

(RQ3UAC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL	ALPHA	2Y/BX	MACH	RN/L	PARAMETRIC VALUES	BETA
□	-5.000	.800	4.500	5.000		.000
□	.000	.600				
□		.400				

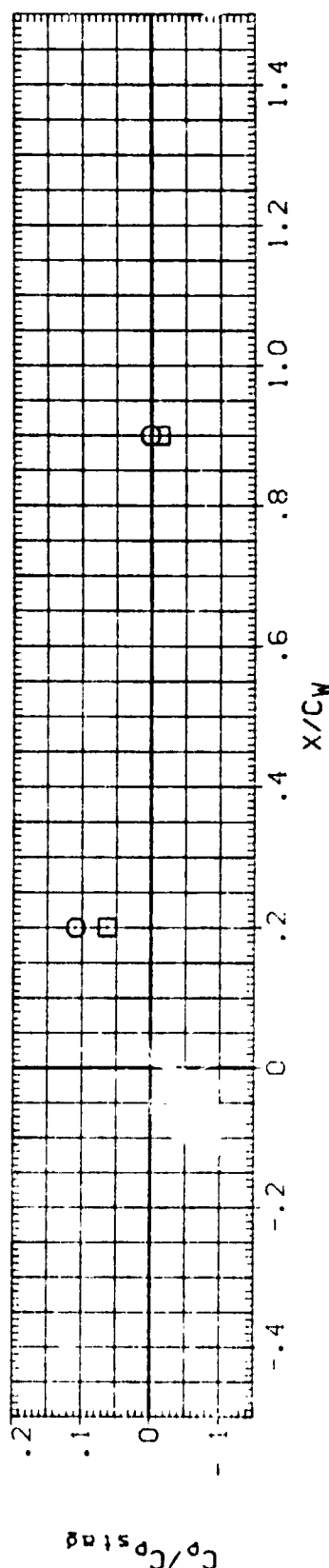
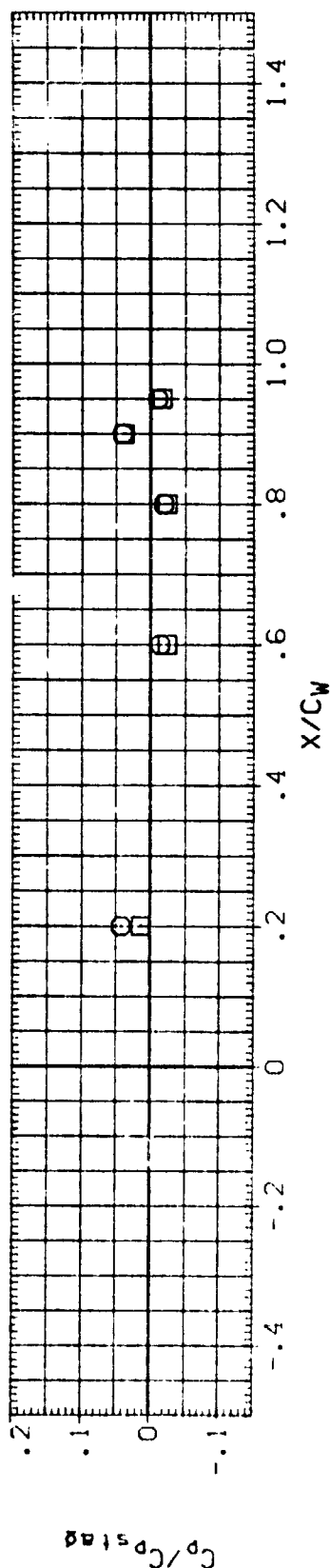
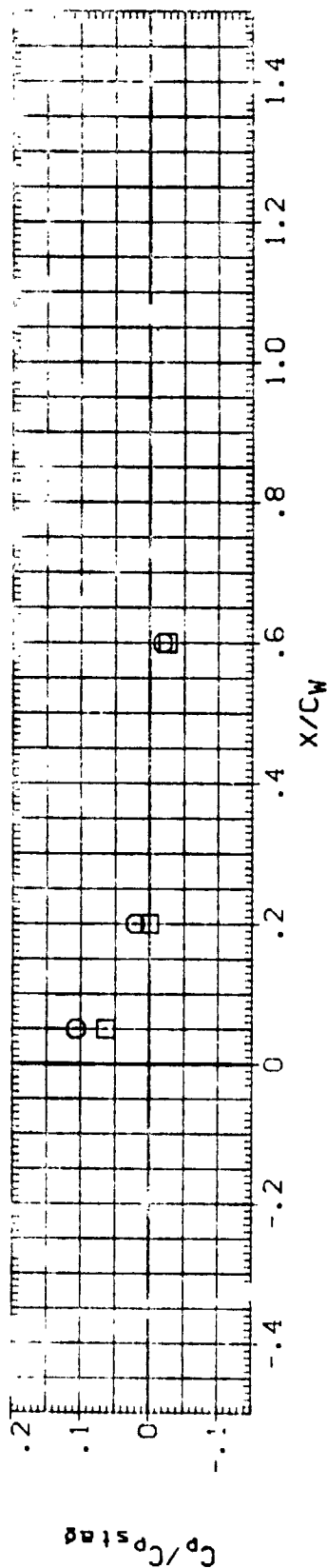


FIG. 24 VARIATION OF C_p/C_{pstag} ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING. BETA= 0, RN/L= 5.0

(RQ3VAC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

ALPHA	Z/SV	MACH	RN/L	PARAMETRIC VALUES
0.000	.299	2.950	5.000	BETA
5.000	.532			.000
	.765			

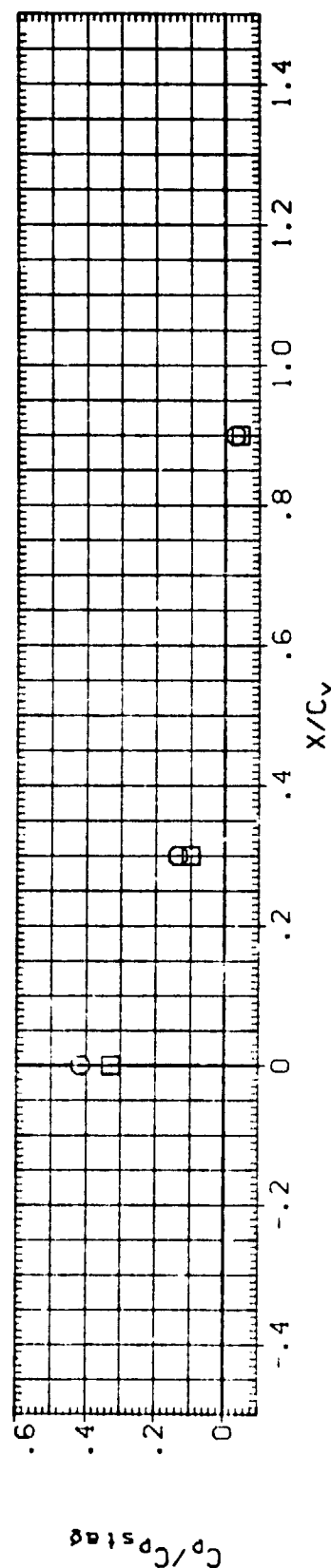
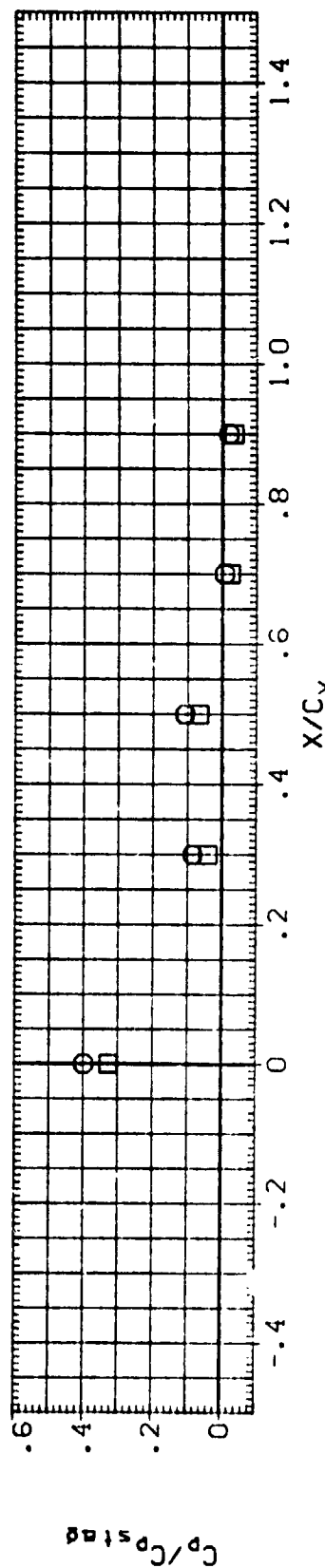
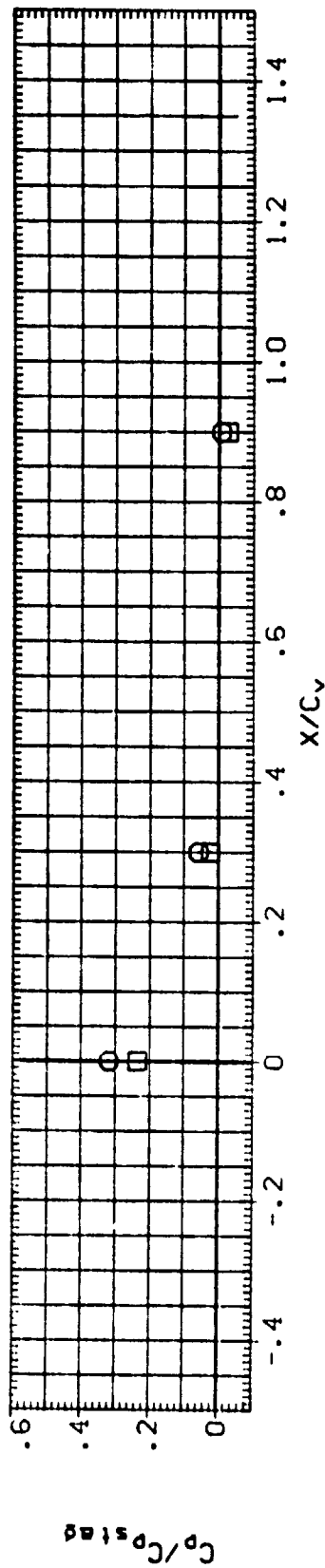


FIG. 25 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 0. RN/L= 5.0

(RQ3VAC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL \square \circ

ALPHA
-5.000
.000
.765

Z/BV
.293
.532
.765

MACH
3.700

RN/L

PARAMETRIC VALUES
5.000 BETA

.000

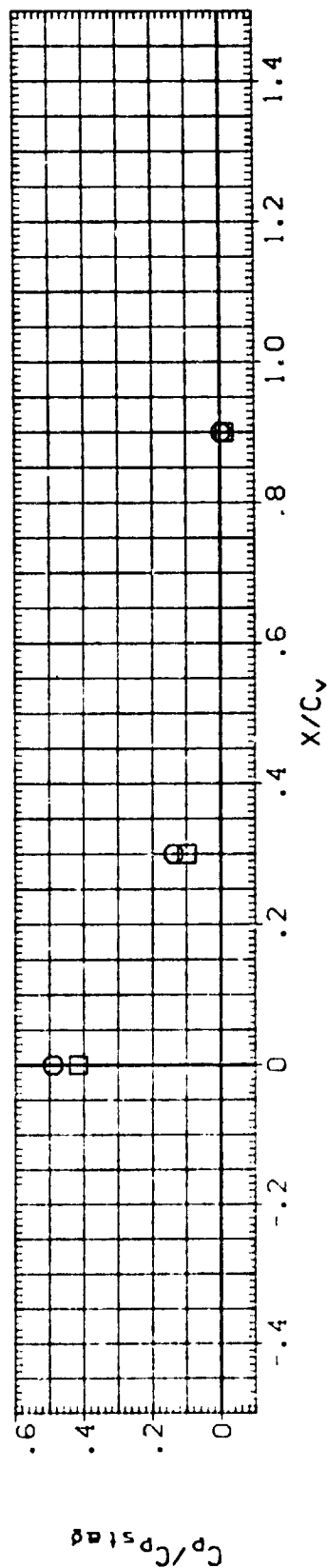
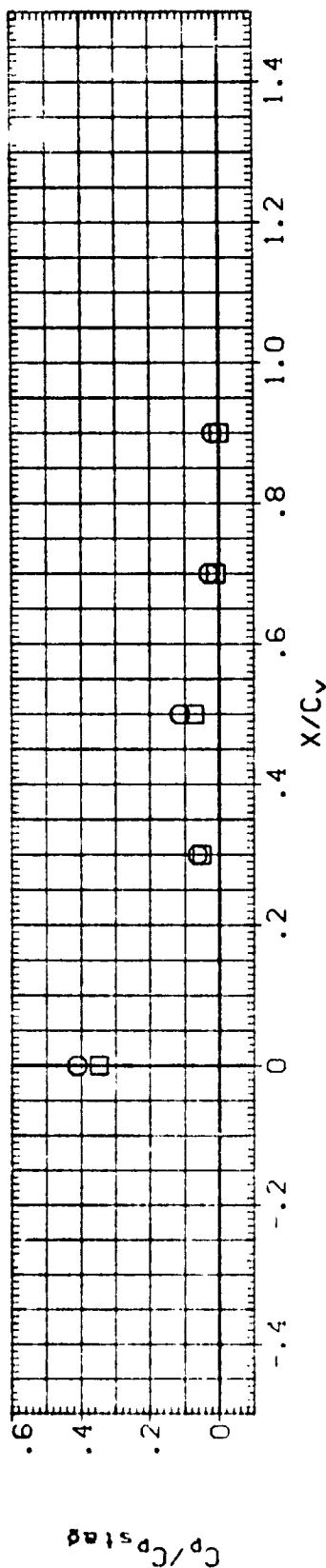
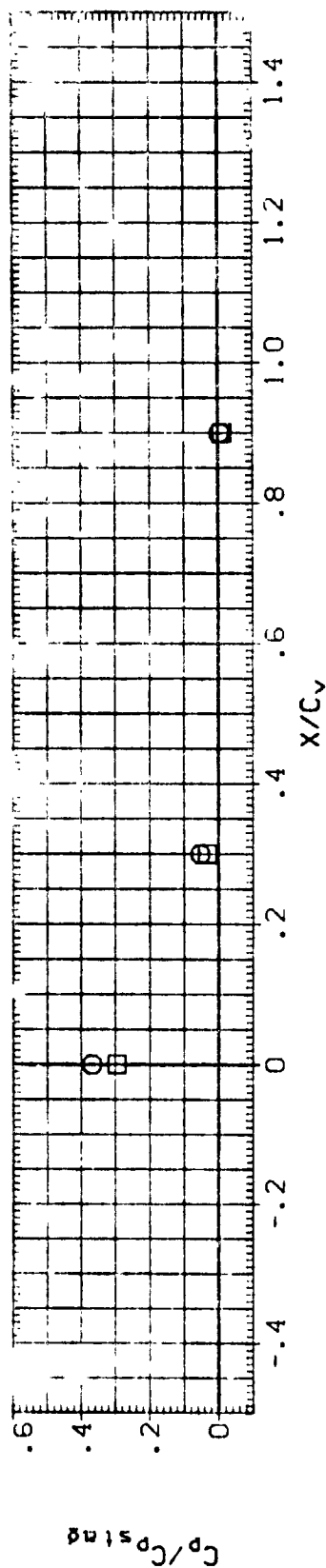


FIG. 25 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 0. RN/L= 5.0

(R03VAC) UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL ALPHA Z/3V MAC
 8 -5.000 .299 4.600
 .000 .532 .765

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

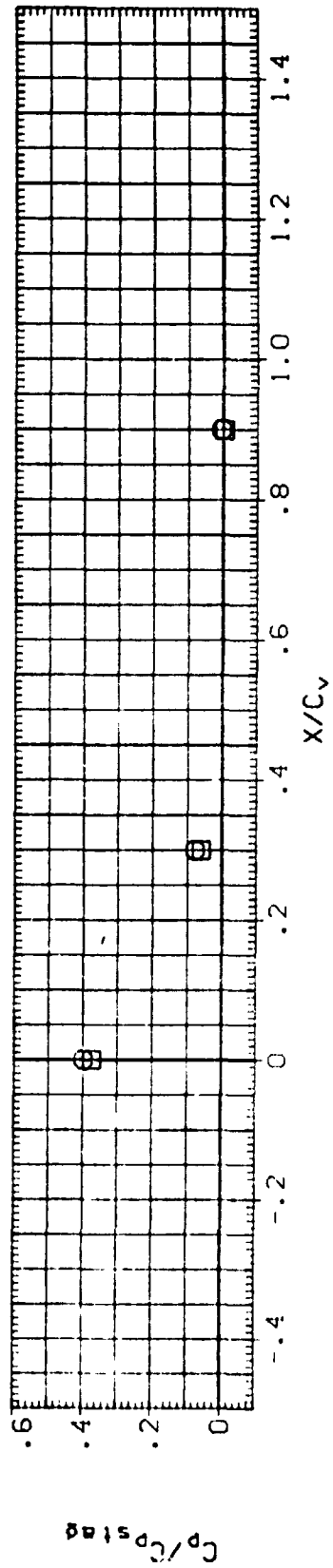
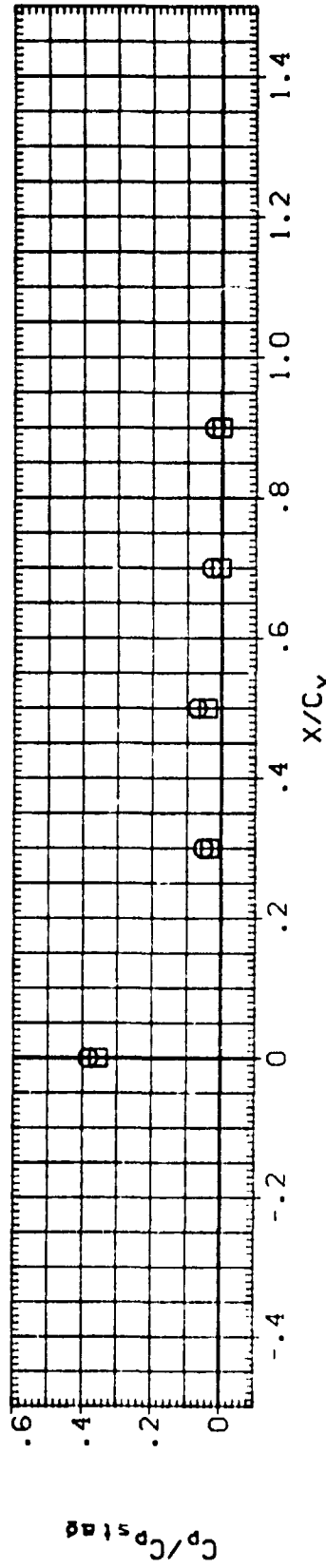
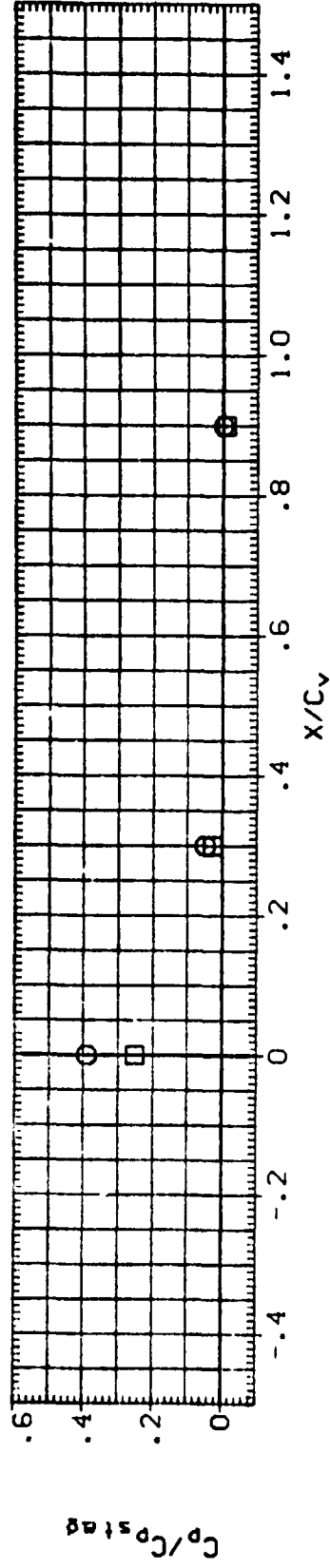


FIG. 25 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 0. RN/L= 5.0

SYMBOL ALPHA THETA MACH
□ .000 67.500 2.950
5.000 .000

PARAMETRIC VALUES
RN/ 5.000 BETA .000

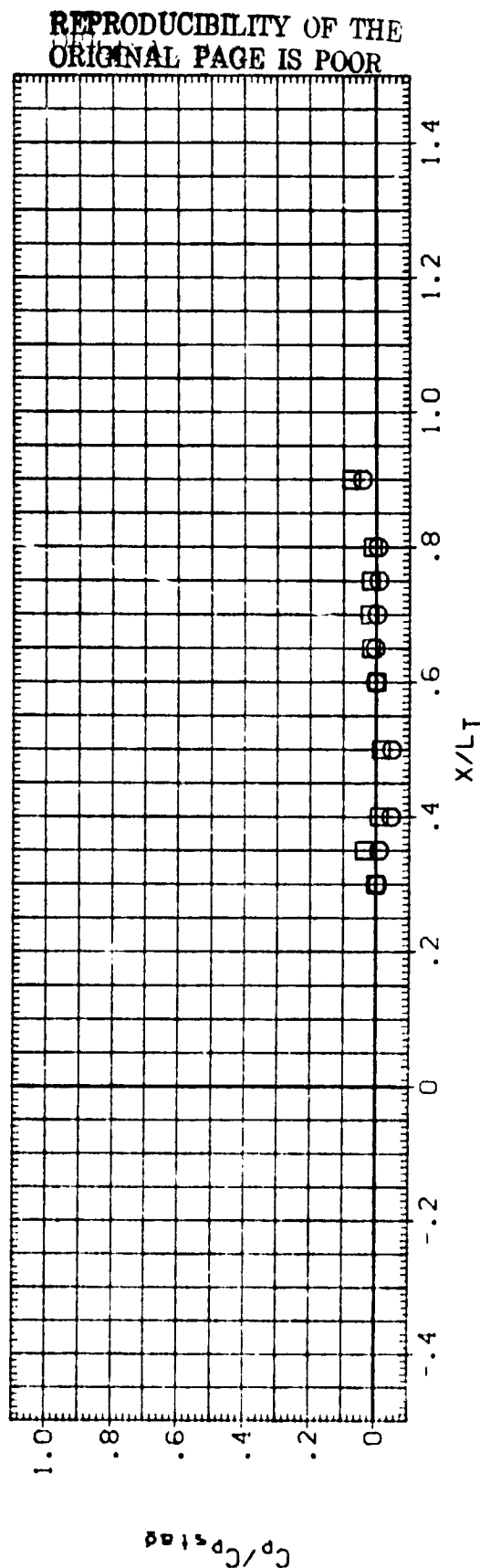
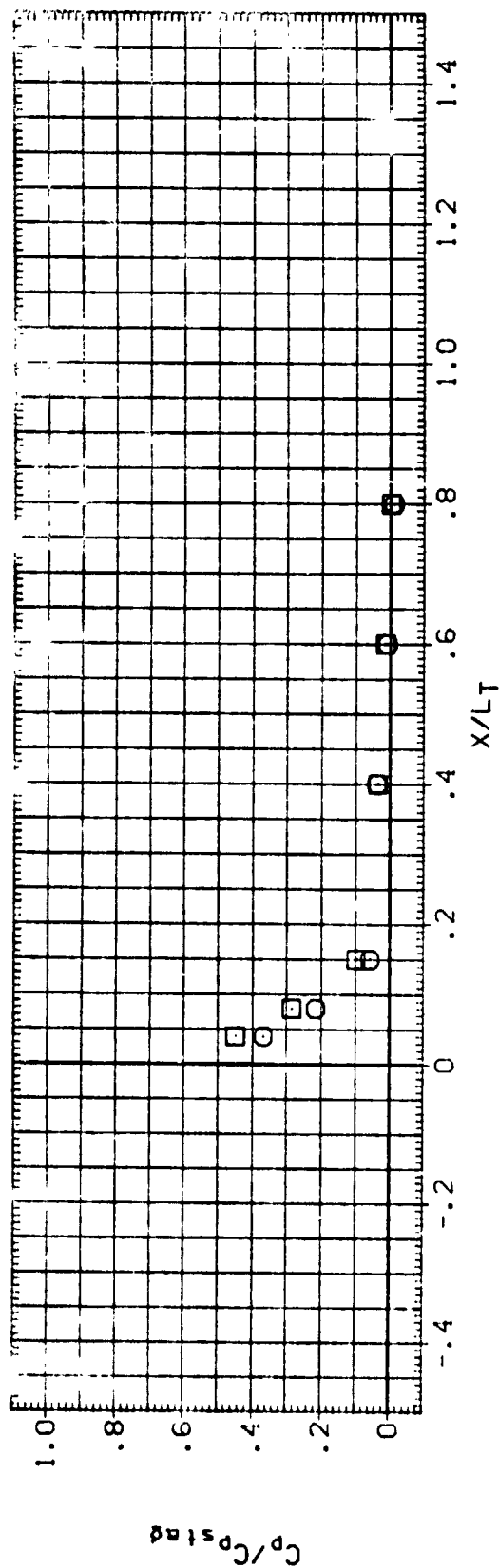


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 8 .000 112.500 2.950
 5.000 90.000

PARAMETRIC VALUES
 5.000 BETA .000
 RN/L

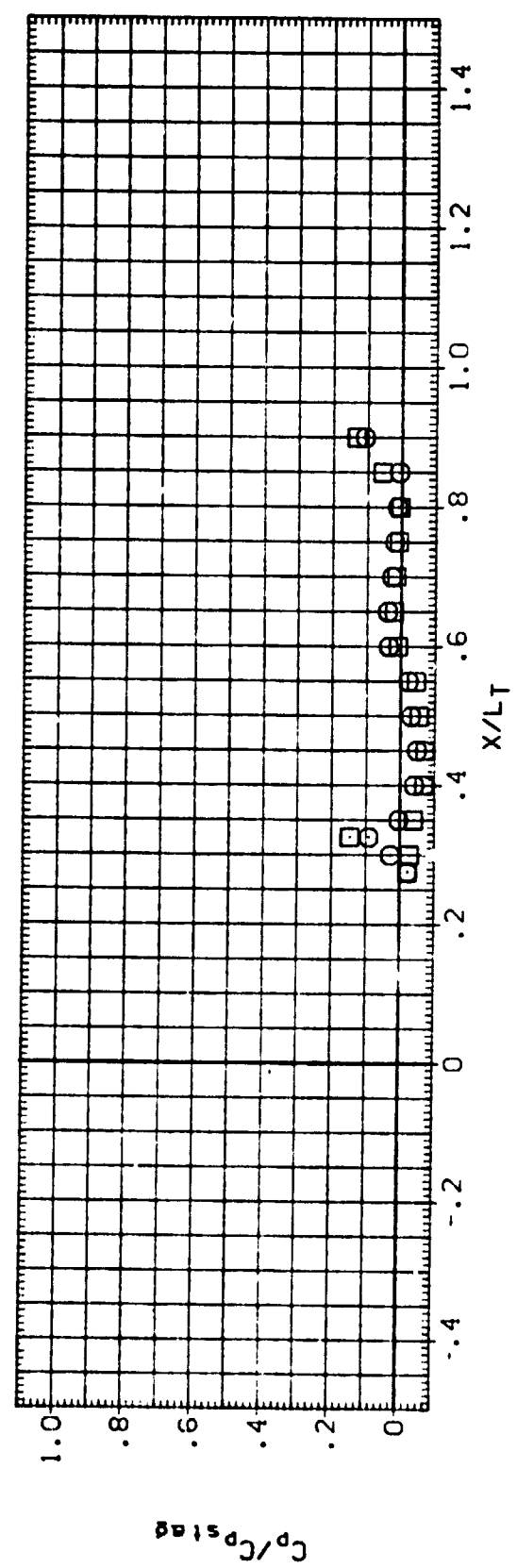
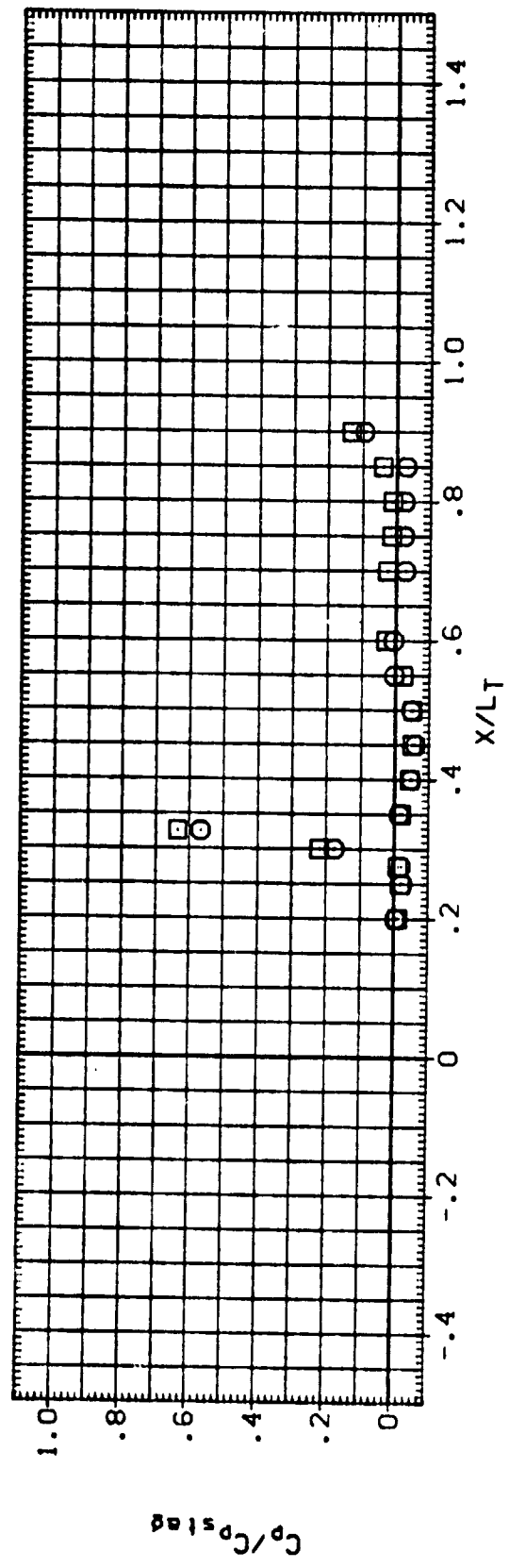


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK
 SYMBO ALPHA THETA MACH
 0 .000 135.000 2.950
 5.000 123.000

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

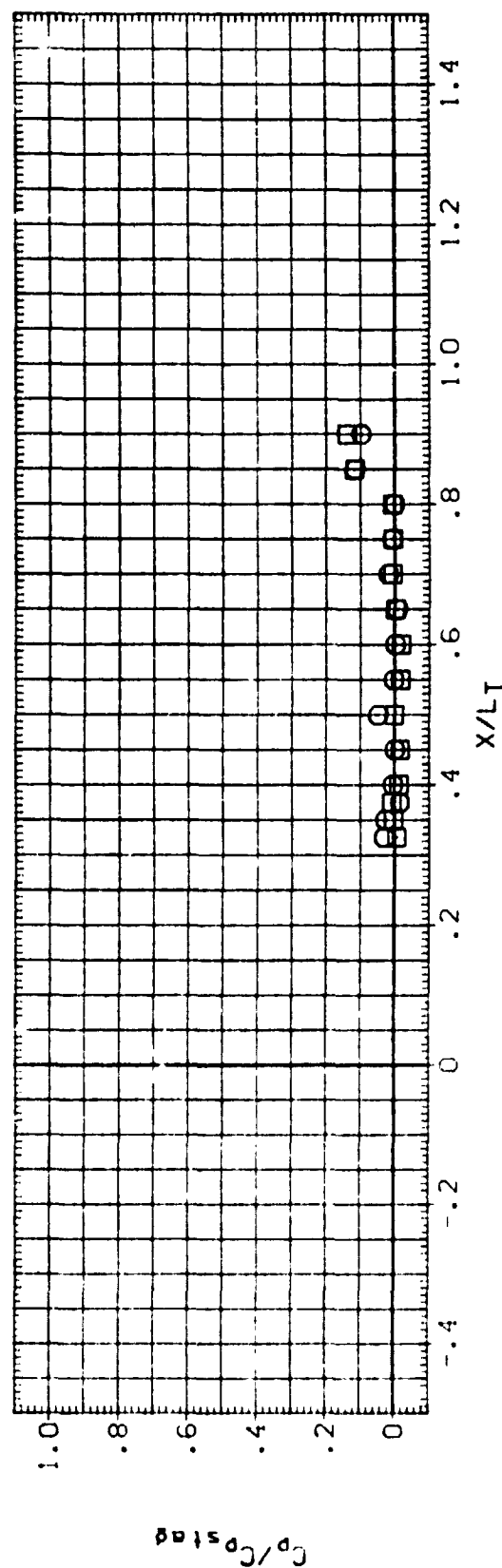
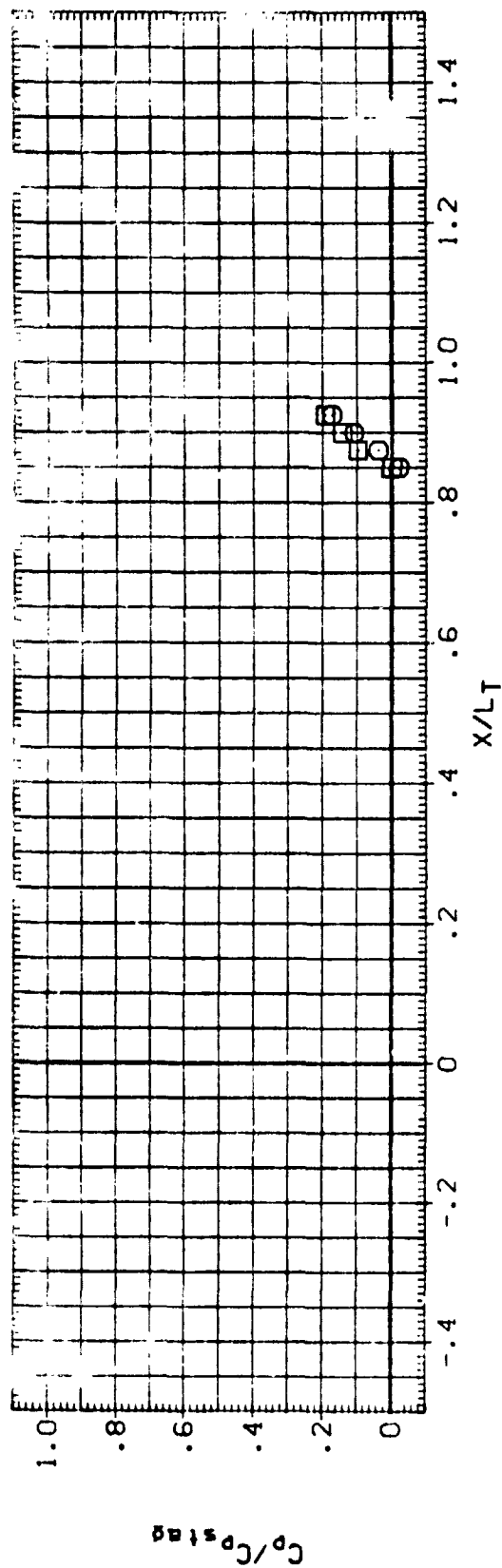


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
5.000 BETA .000

RN/L

MACH 2.950

THETA 180.000

ALPHA 5.000

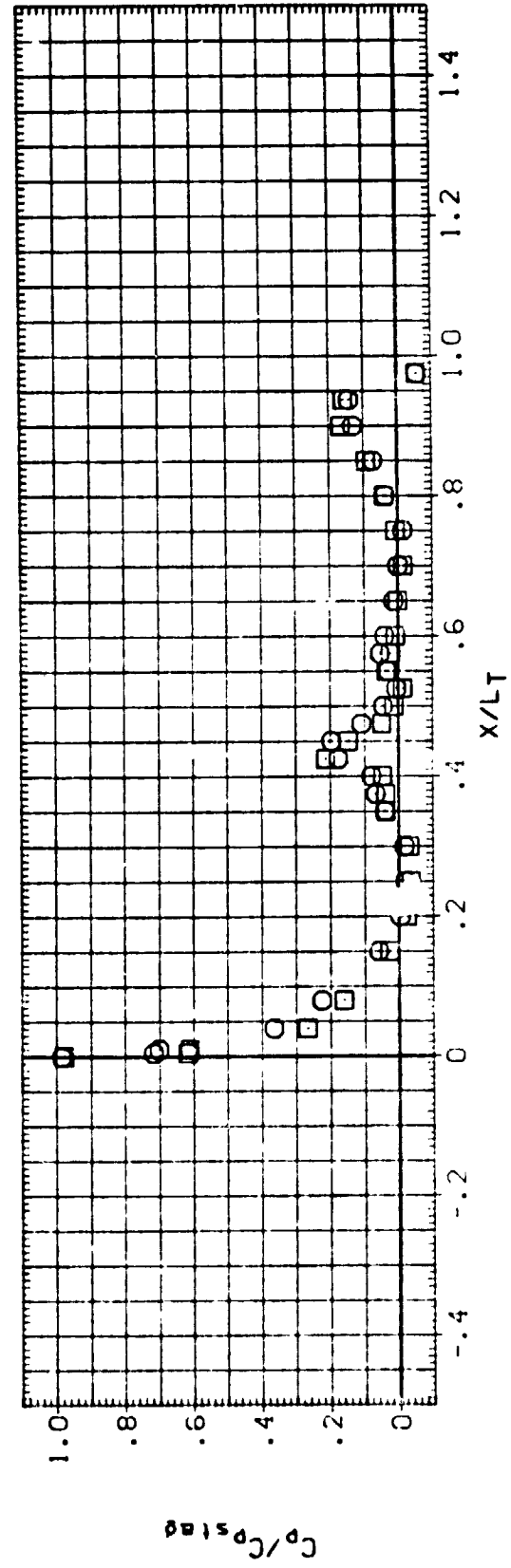
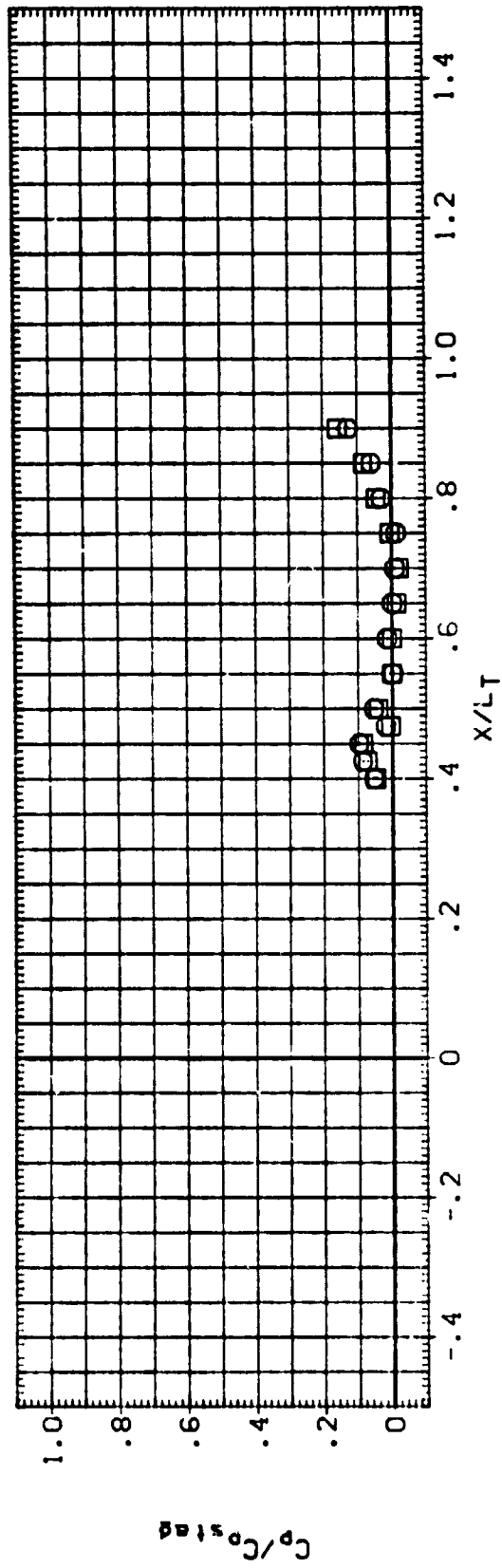


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

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ORIGINAL PAGE IS POOR

(R02TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
□ .000 210.000 2.950
□ 5.000 197.000

PARAMETRIC VALUES
5.000 BETA .000

RN/L

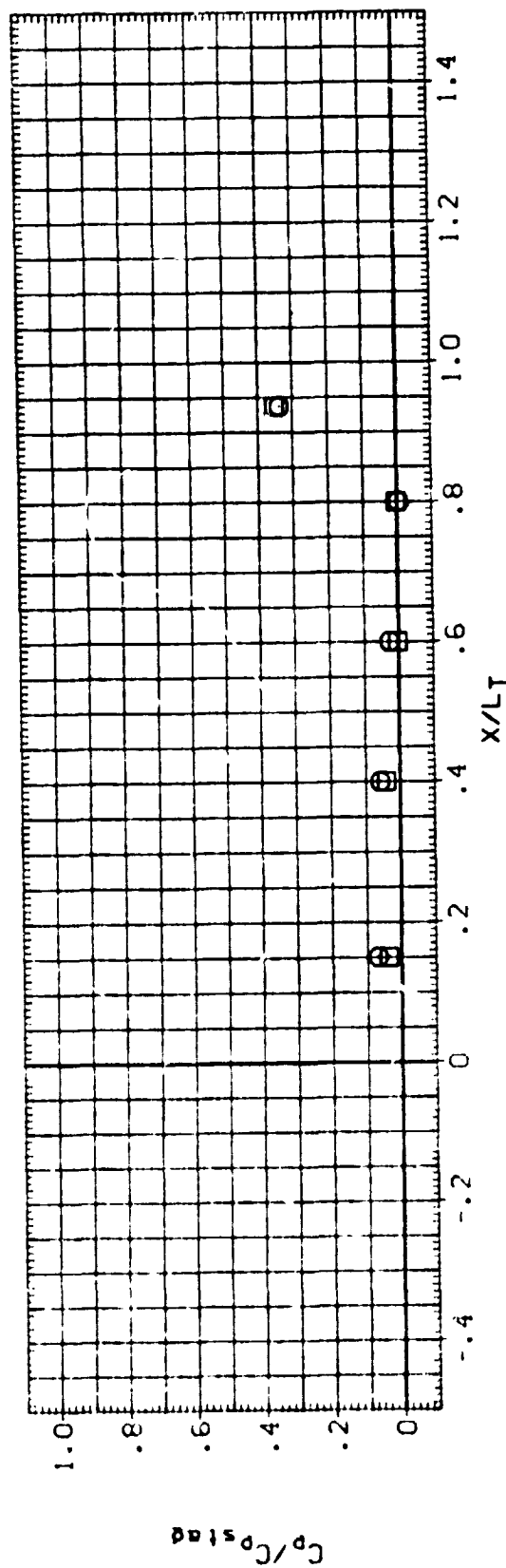
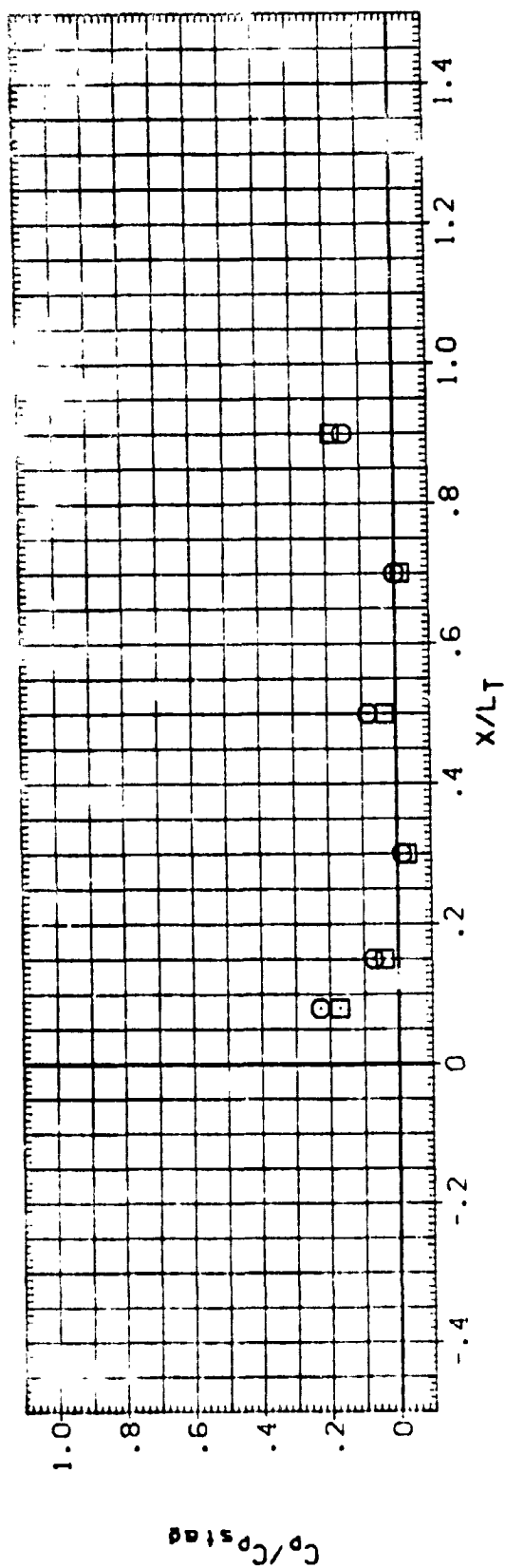


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

[RQ3TAC] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACM
 □ -5.000 67.500 3.700

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

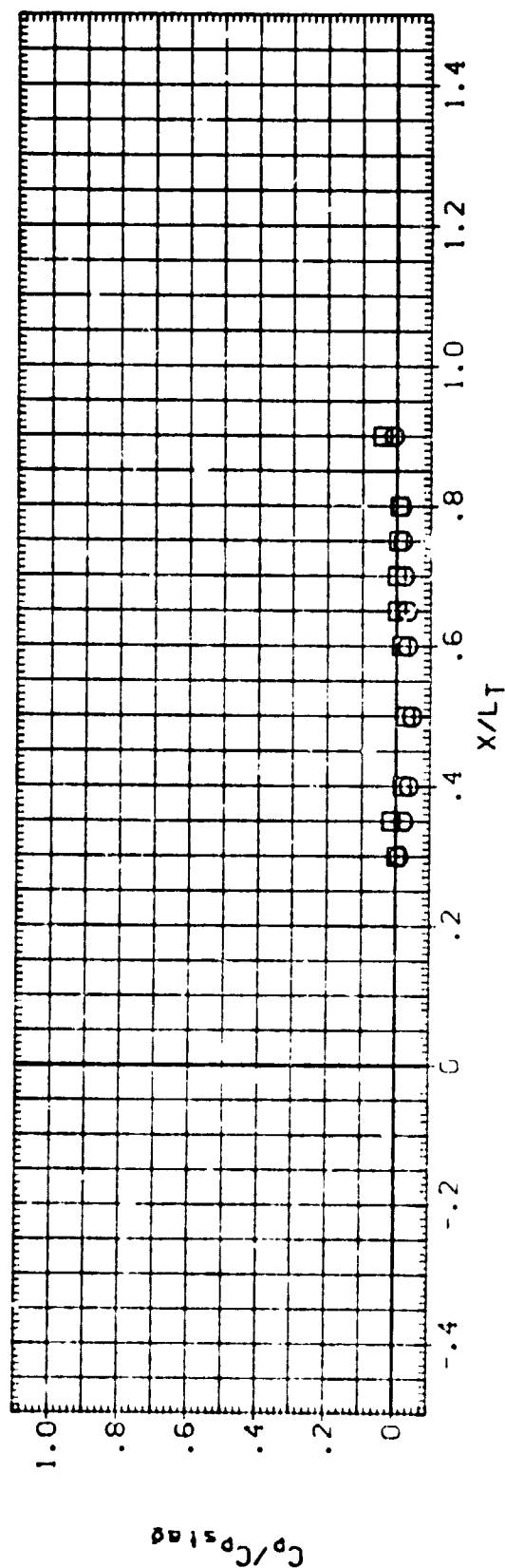
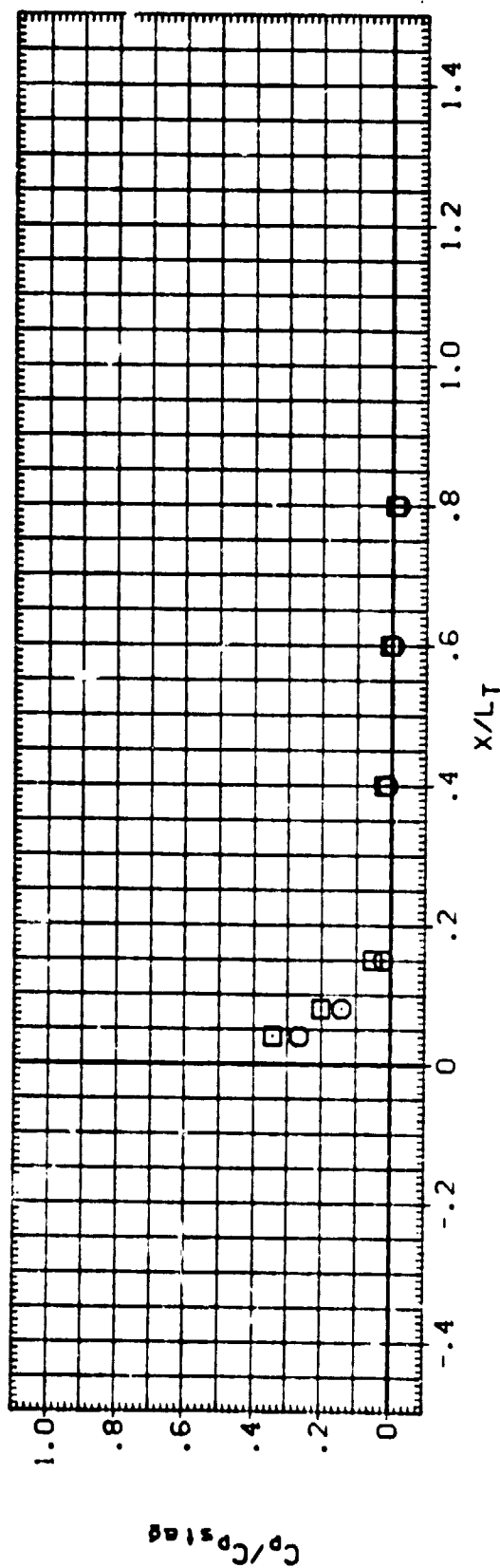


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. $RN/L = 5.0$

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA T-BETA MACH
 8 -5.000 112.500 3.700
 90.000

PARAMETRIC VALUES
 5.000 BETA .000

RN/L

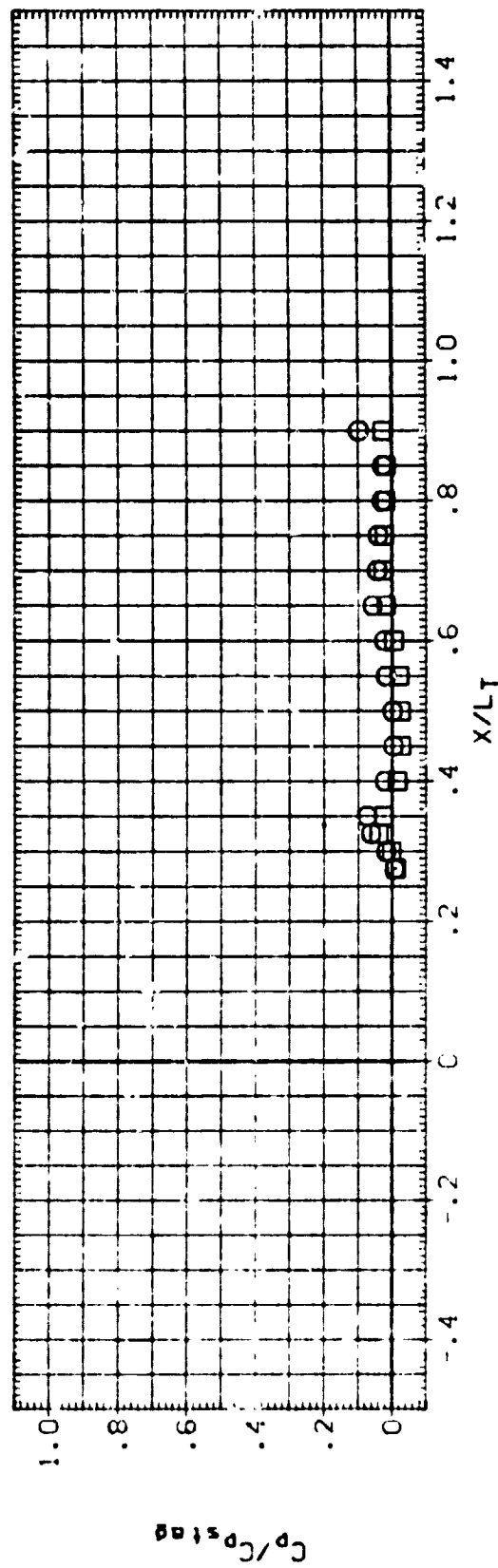
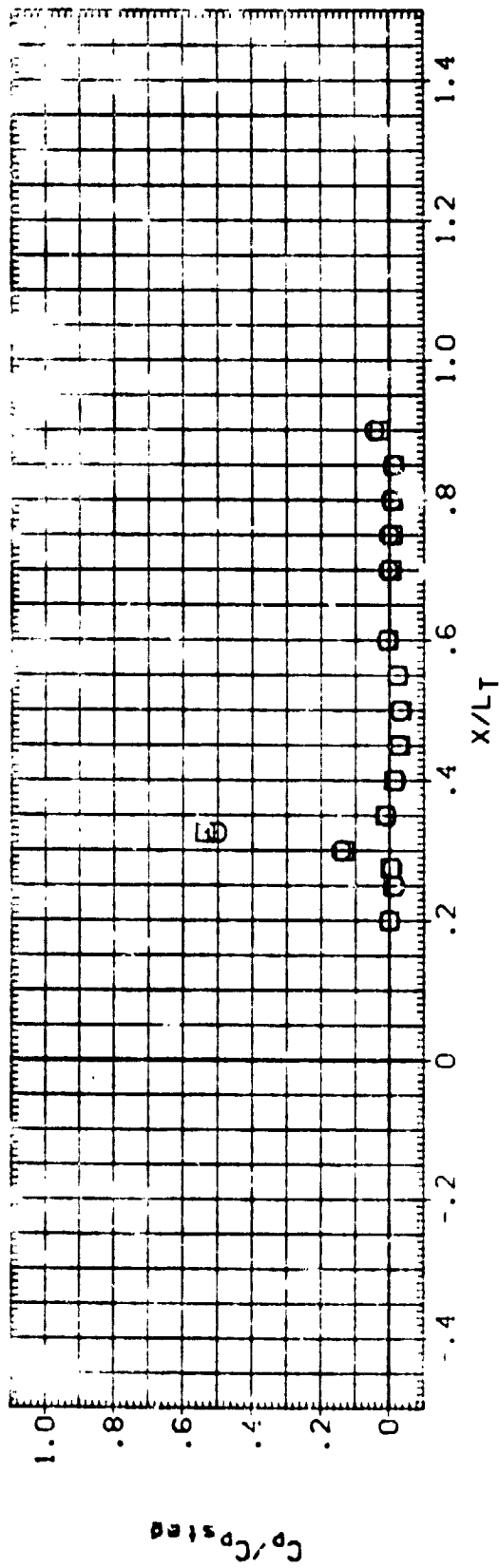


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPH THETA MACH
 -5.000 135.000 3.700
 0.000 123.000

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

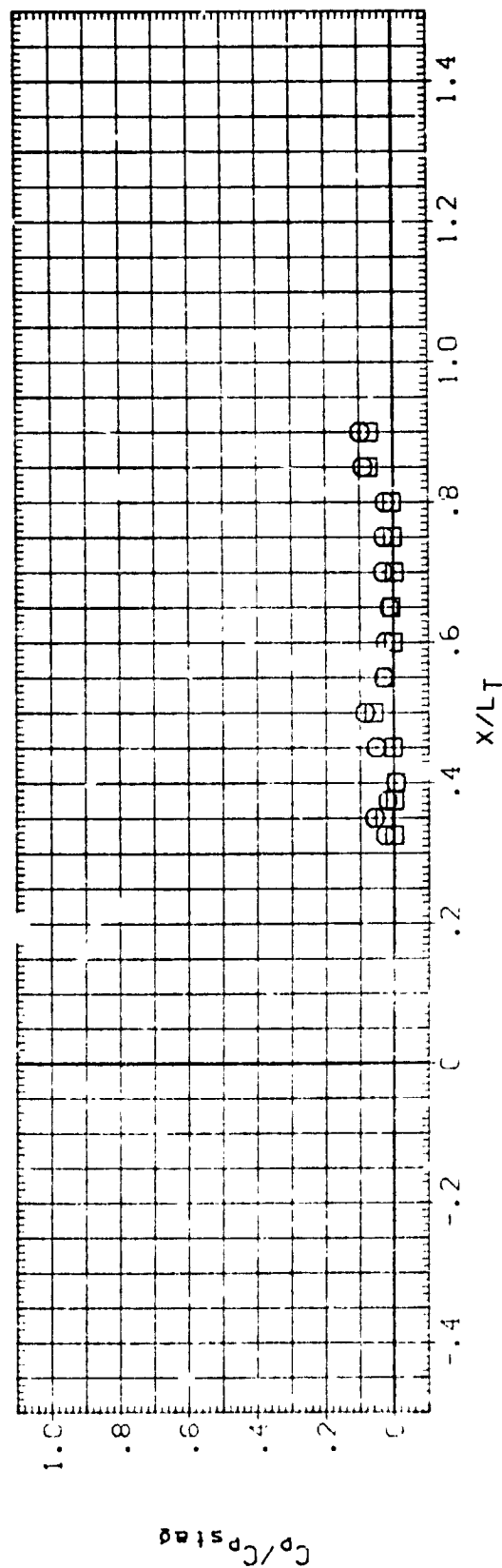
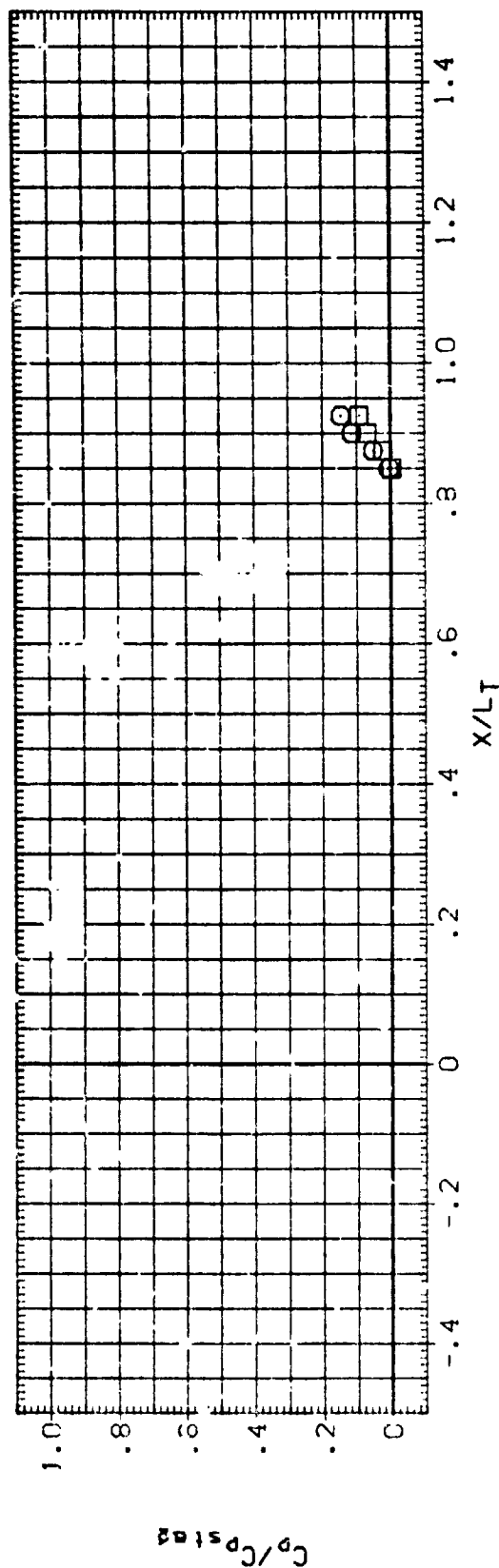


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-38N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 □ -5.00° 180.000 3.700
 ○ 157.500

PARAMETRIC VALUES
 RN/ 5.000 BETA 0.000

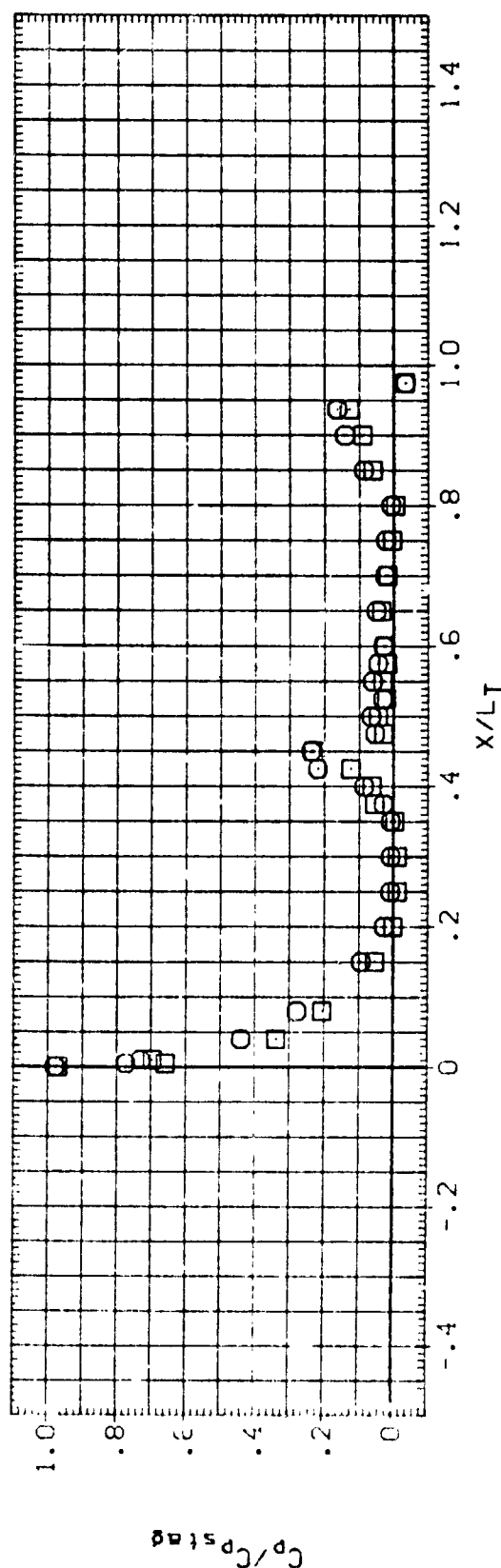
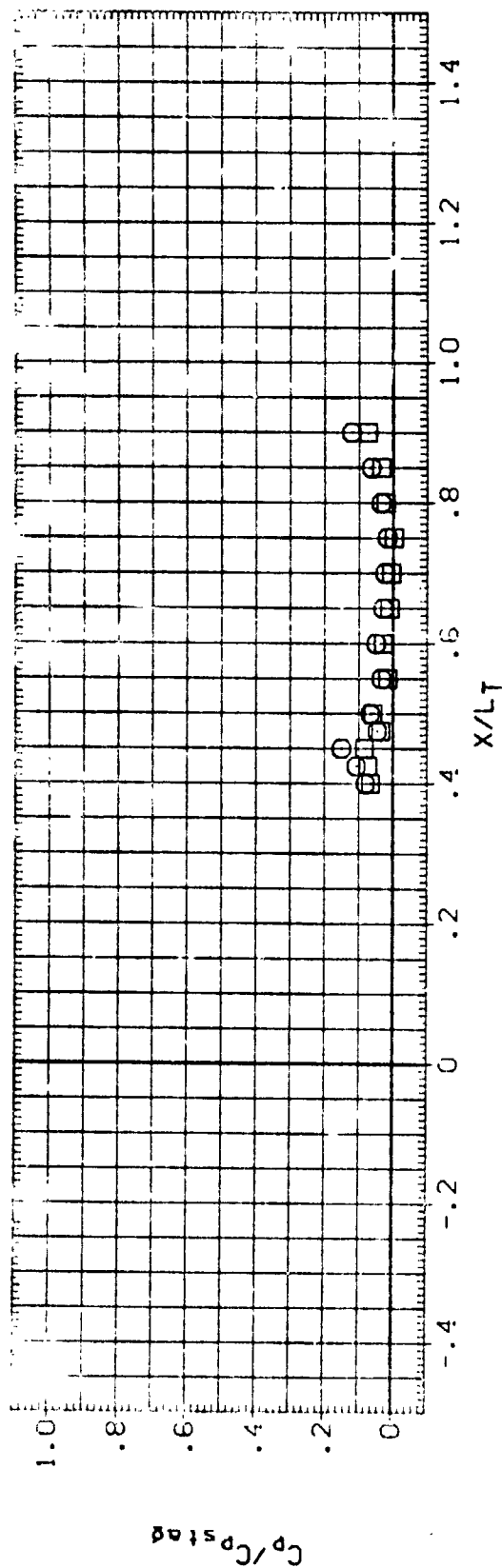


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 8 -5.000 210.000 3.700
 .000 197.000

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

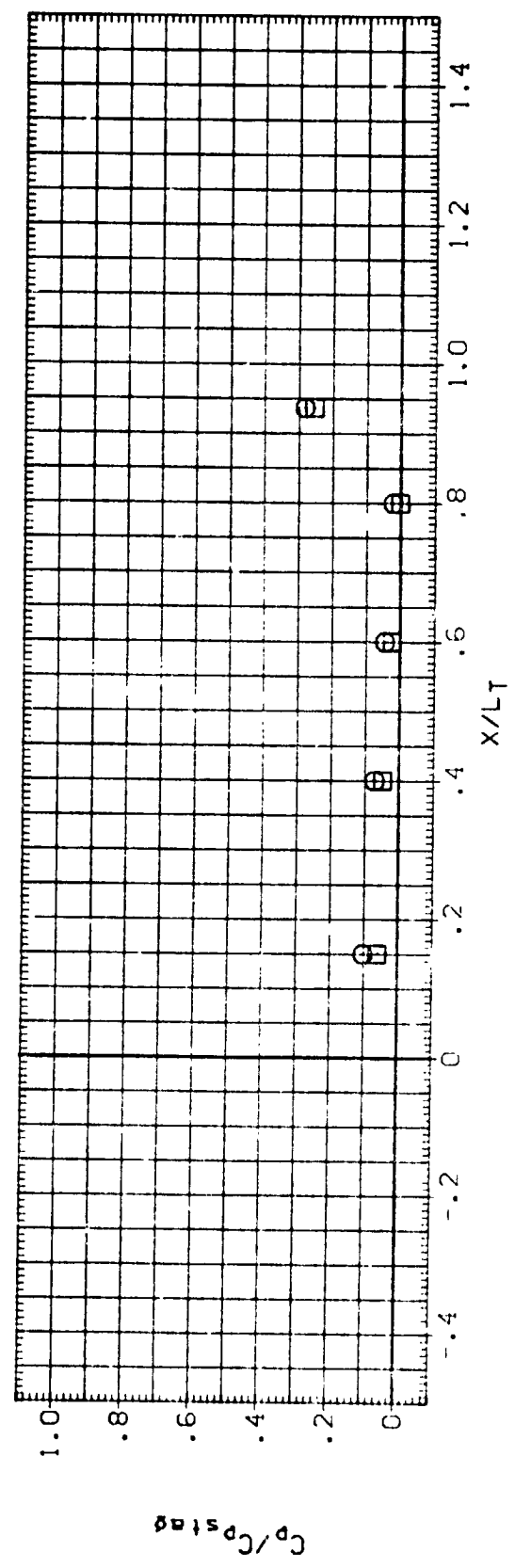
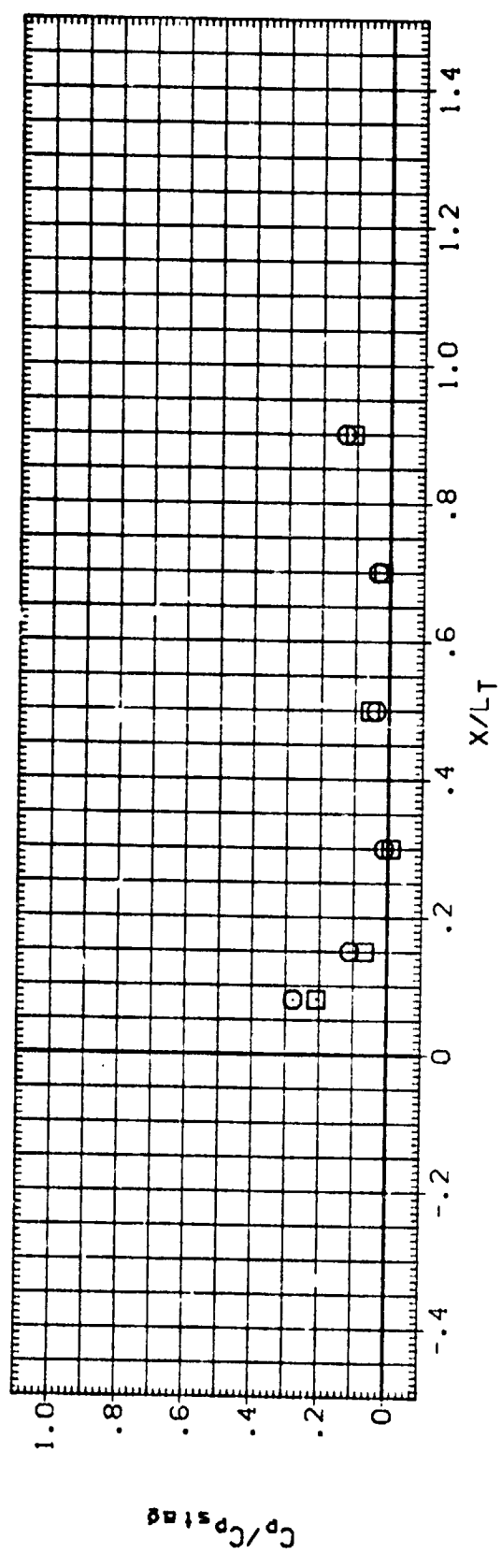


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T1 EXTERNAL TANK. BETA= 0. RN/L= 5.0

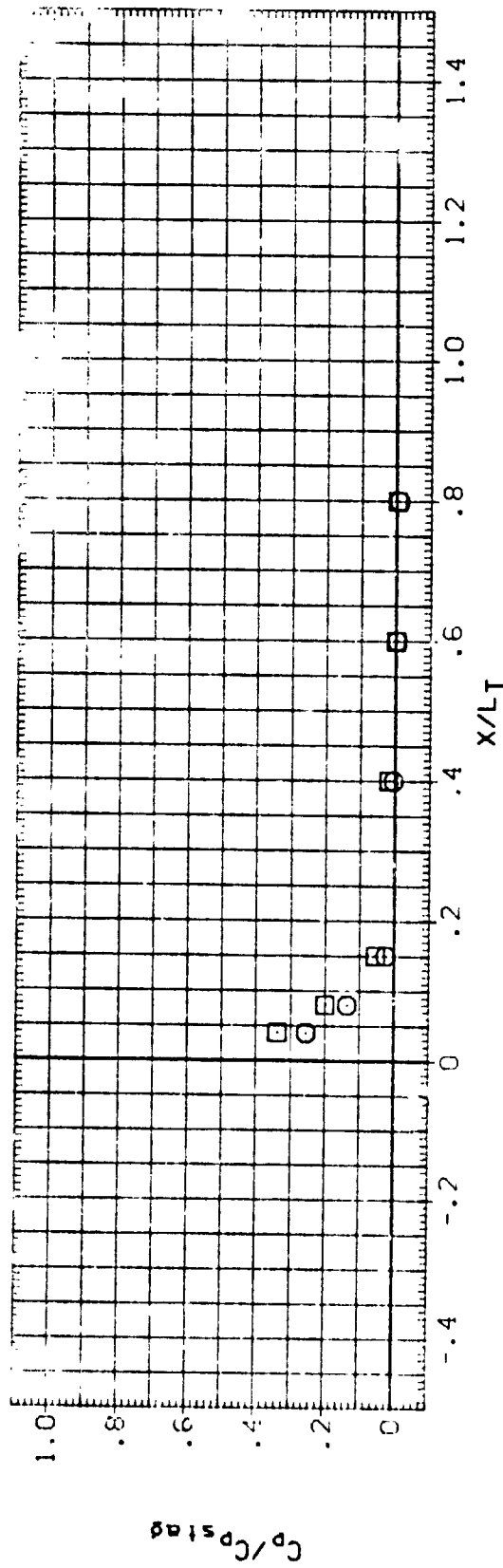
{R03TAC} UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL A-Phi
-5.000
.000

THETA
67.500
.000

MACH
4.500

PARAMETRIC VALUES
P1/L 5.000 BETA .000



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ORIGINAL PAGE IS POOR

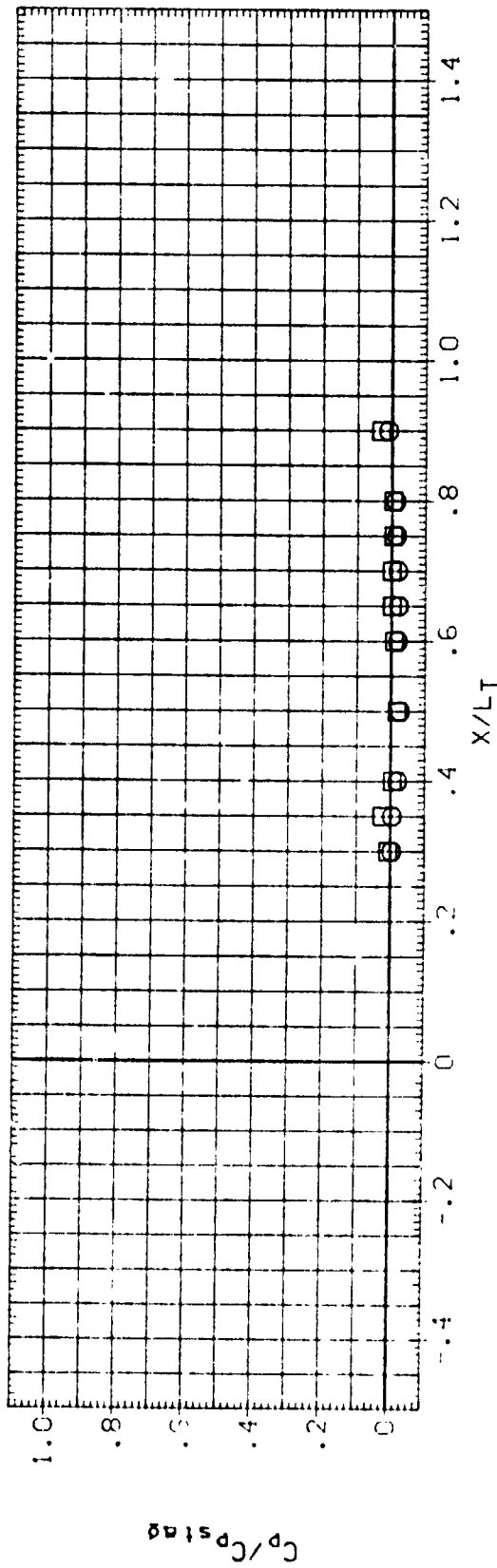


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	RN/L	PARAMETRIC VALUES
Q	-5.000	112.500	4.600		5.000 BETA .000
	.000	90.000			

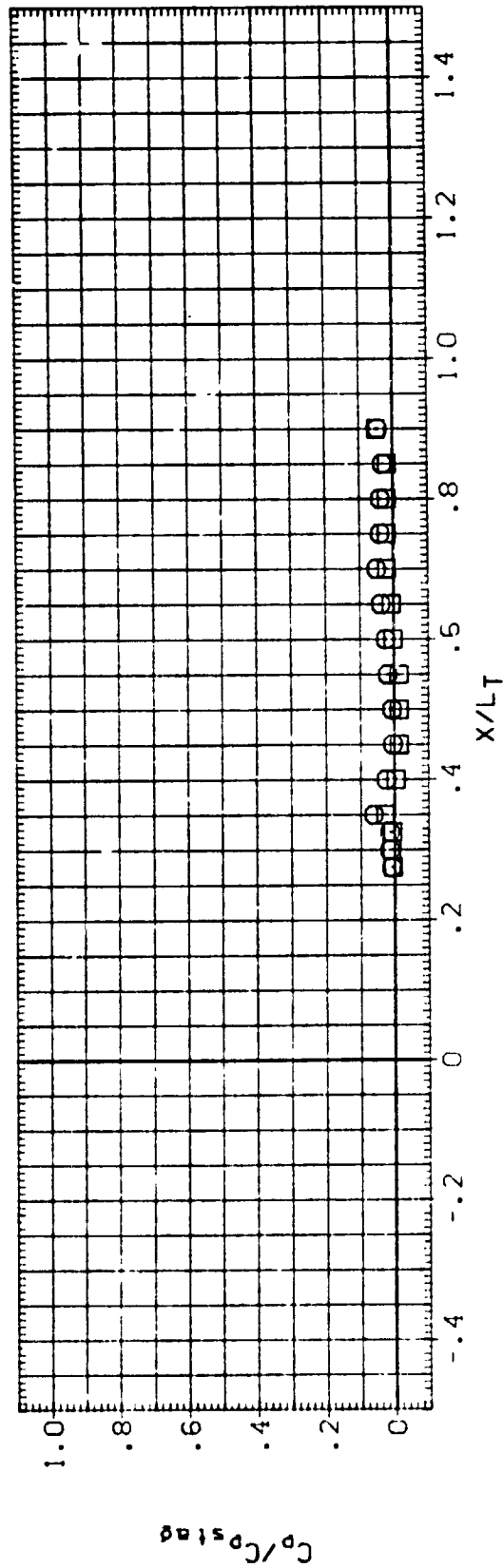
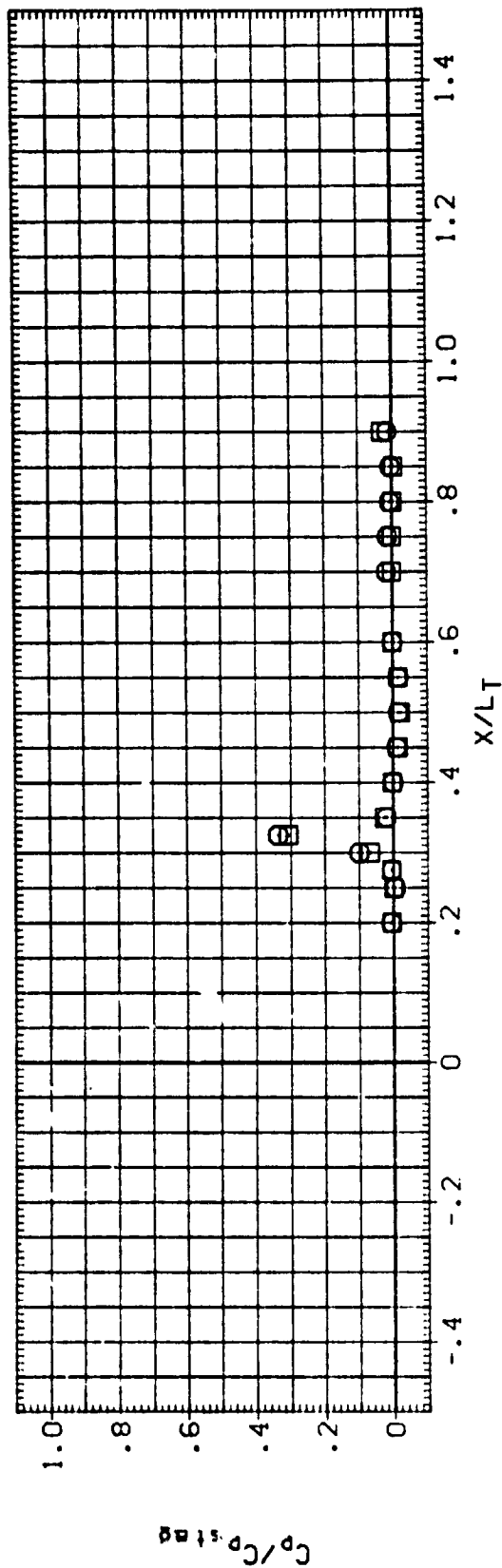


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -5.000 135.000 4.600
 .000 123.000

PARAMETRIC VALUES
 RN/L 5.000 BETA .00

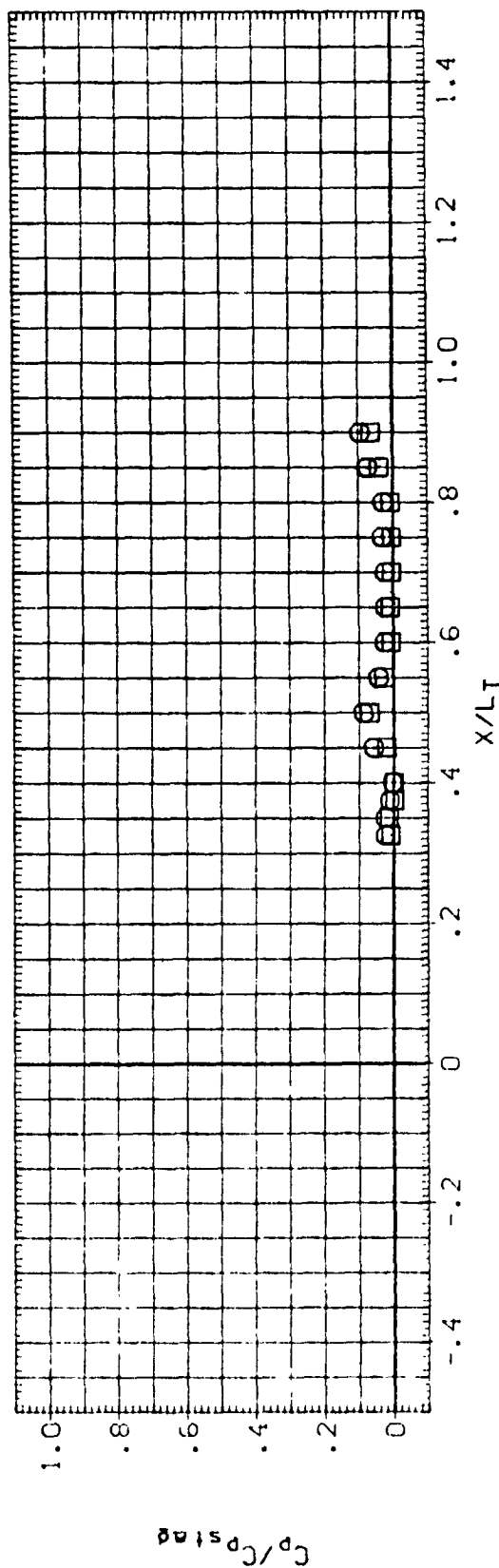
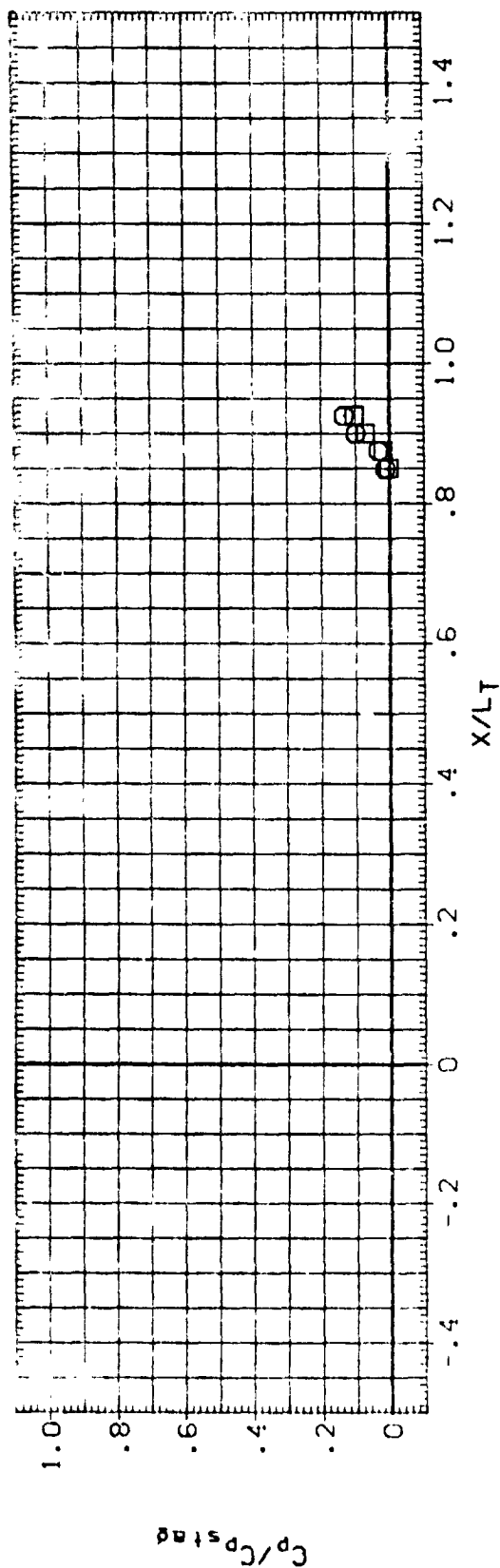


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. $RN/L= 5.0$

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	180.000	4.600	5.000	BETA
□	.000	157.500			.000

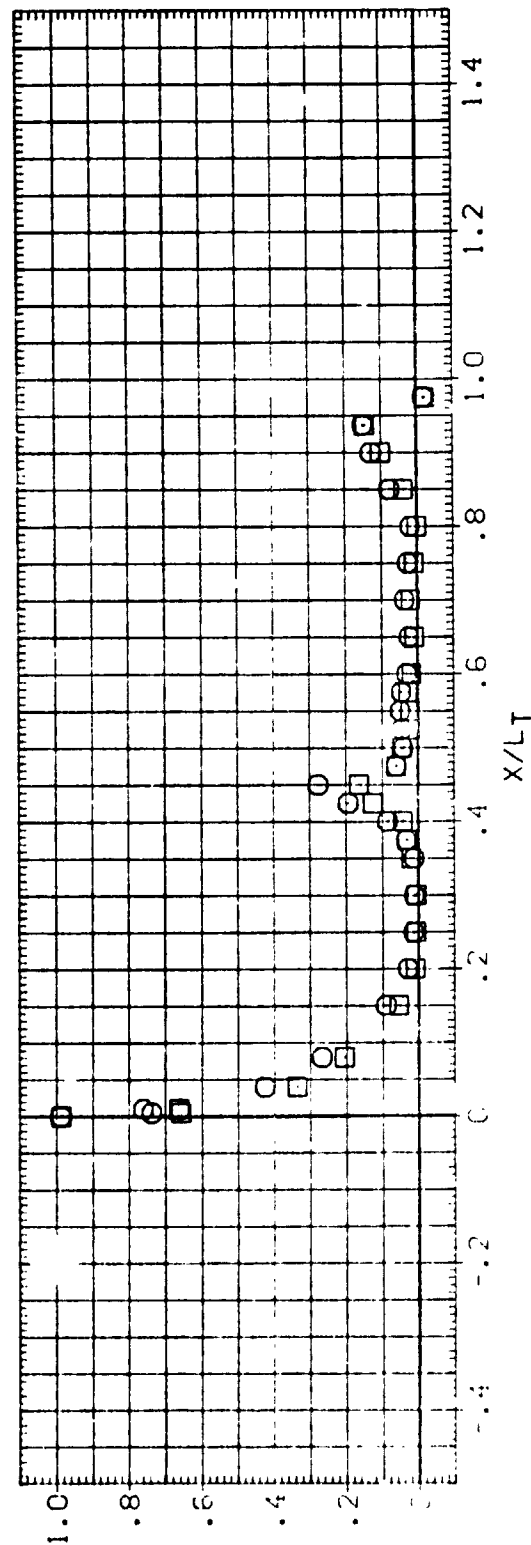
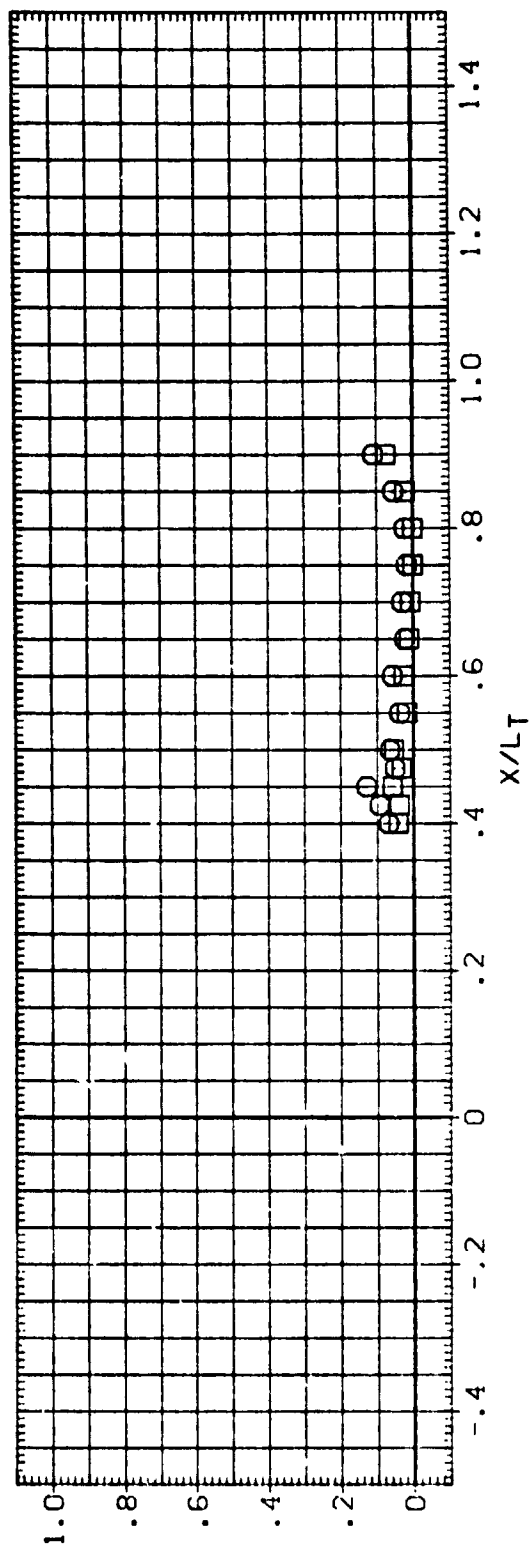


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, $BETA = 0$, $RN/L = 5.0$

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N15 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	PARAMETRIC VALUES	
□	-5.000	210.000	4.600	5.000	BETA
□	.000	197.000			.000

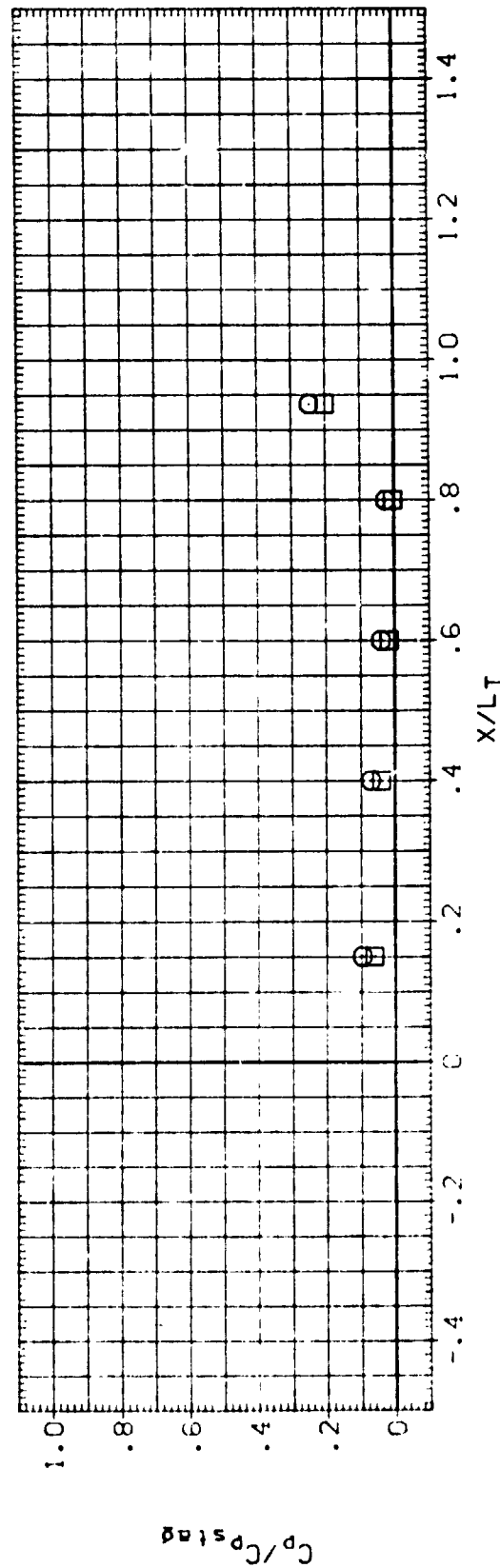
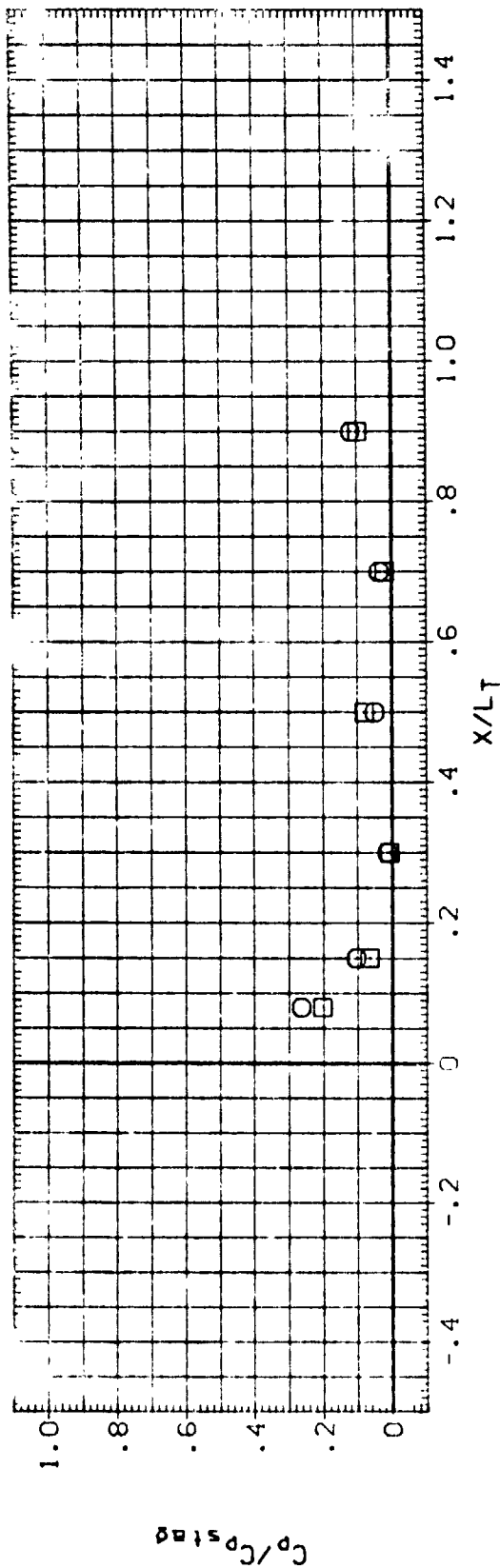


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	.000	.350	2.950	5.000	BETA
□	.000	.300			.000

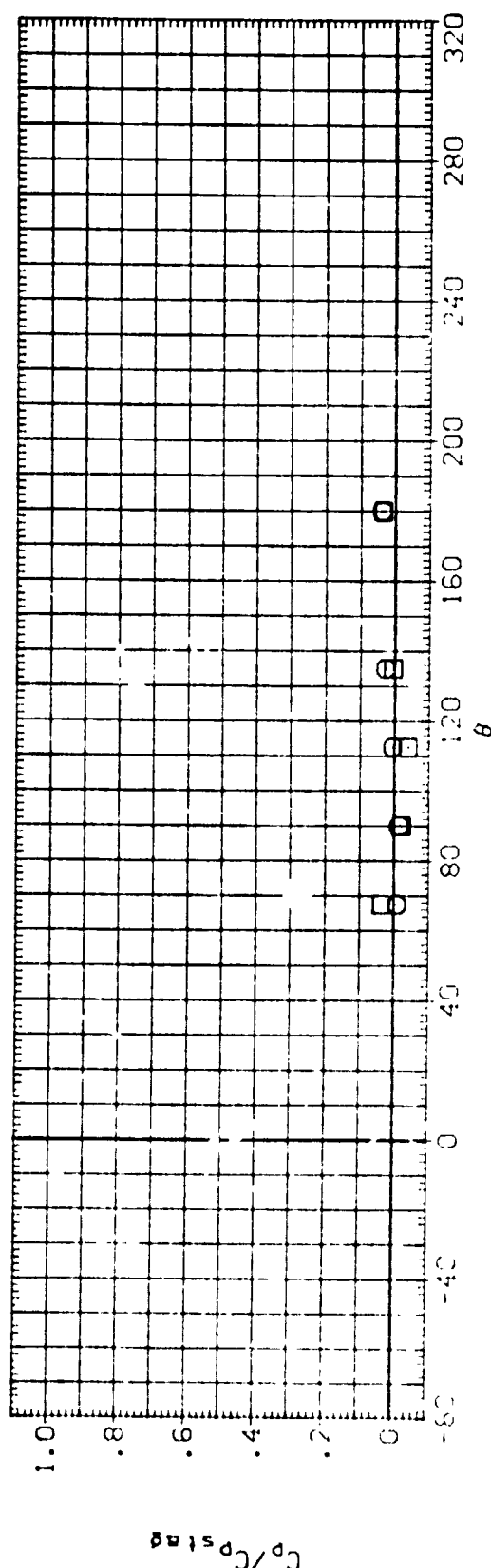
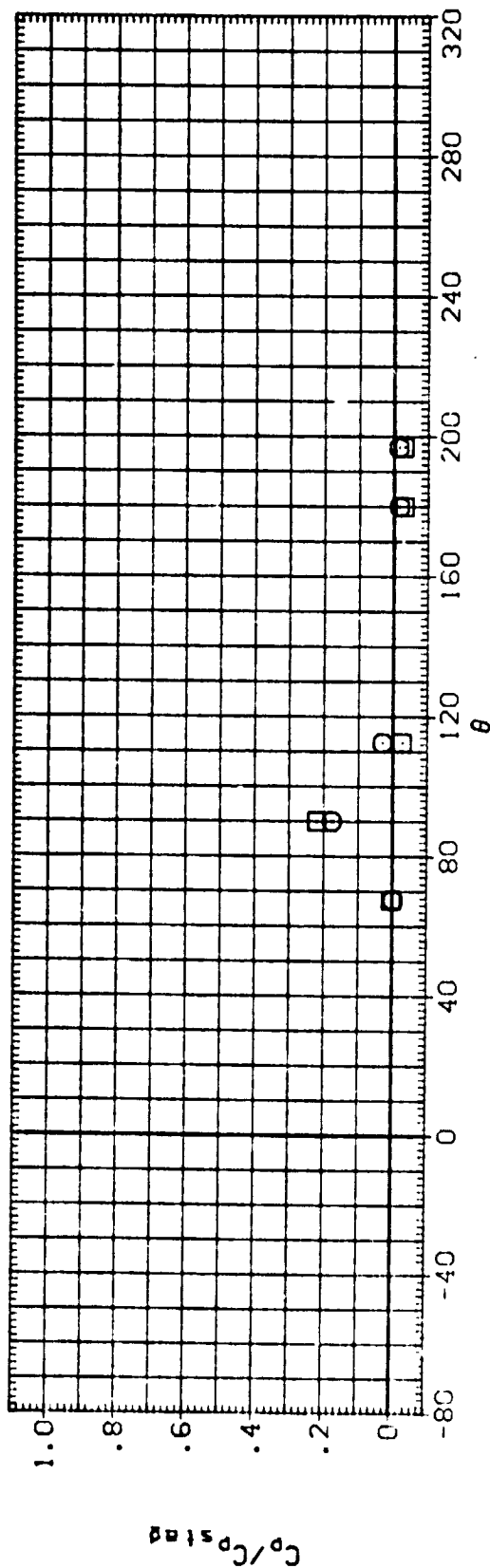


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
5.000 5.000 BETA .00

ALPHA .000
X/LT .500
M/CH 2.950
5.000 .400

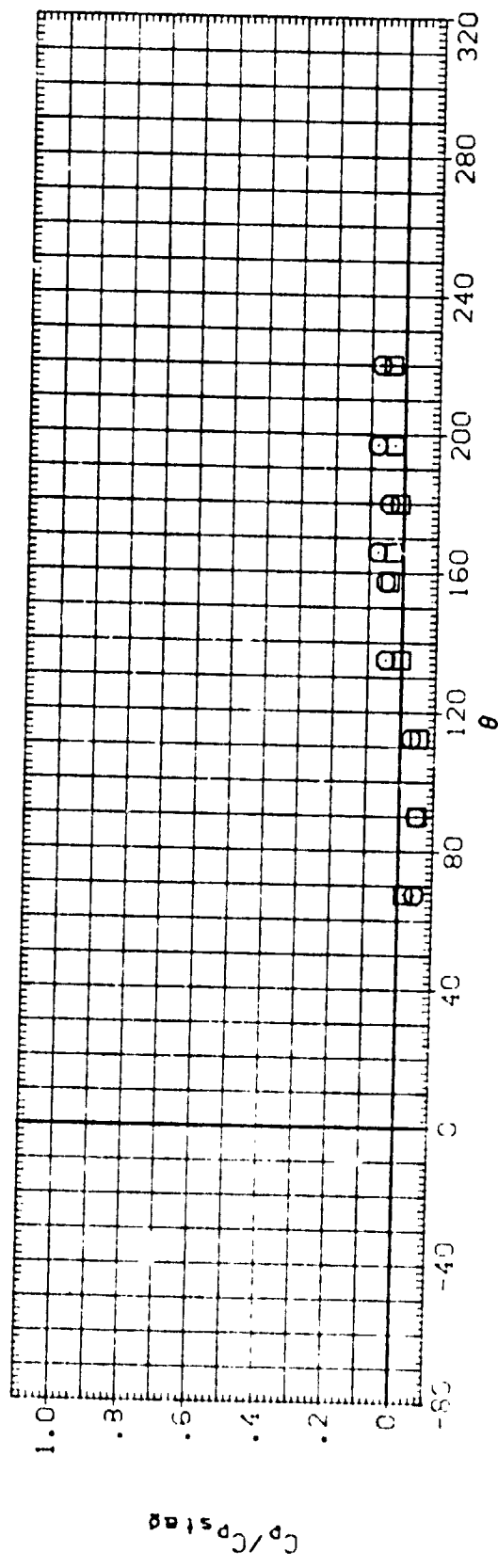
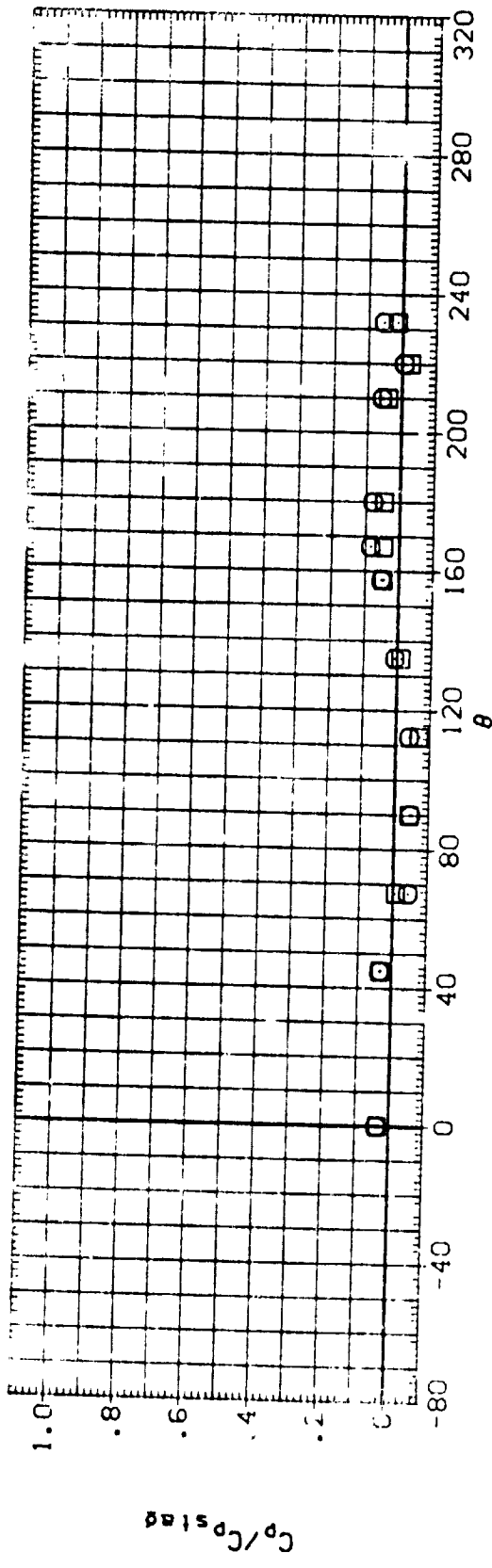


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK. BETA= 0. RN/L= 5.0

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH 5.000 .000 .600 2.950

PARAMETRIC VALUES 5.000 BETA .000

RN/L

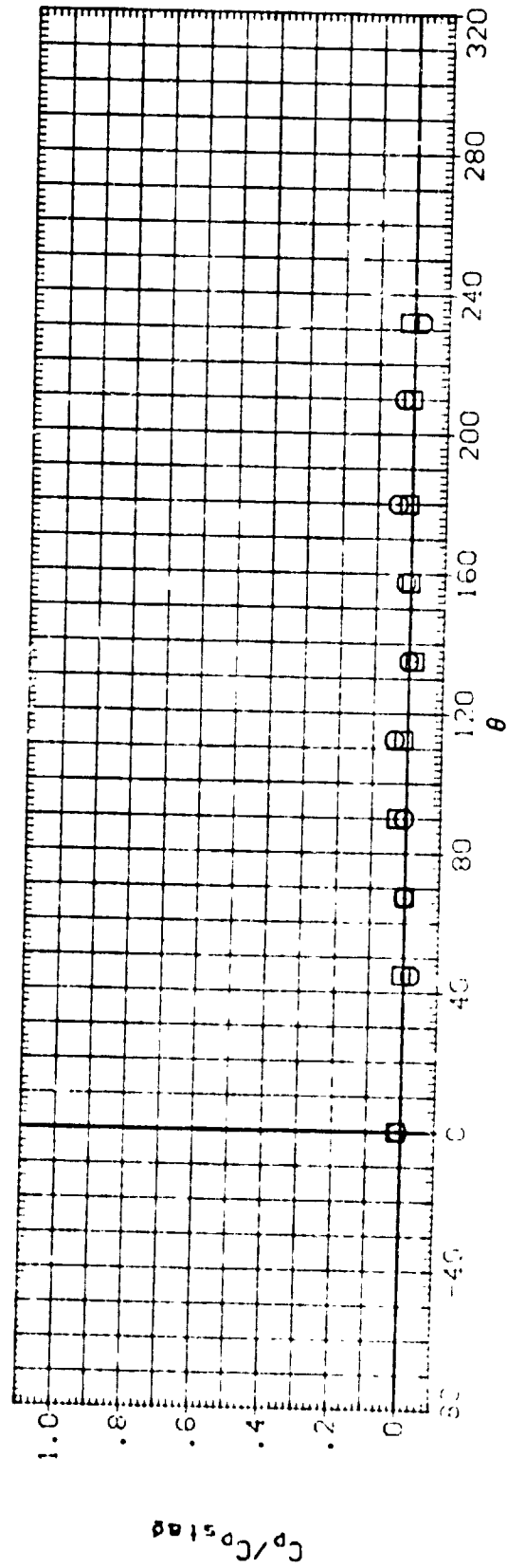
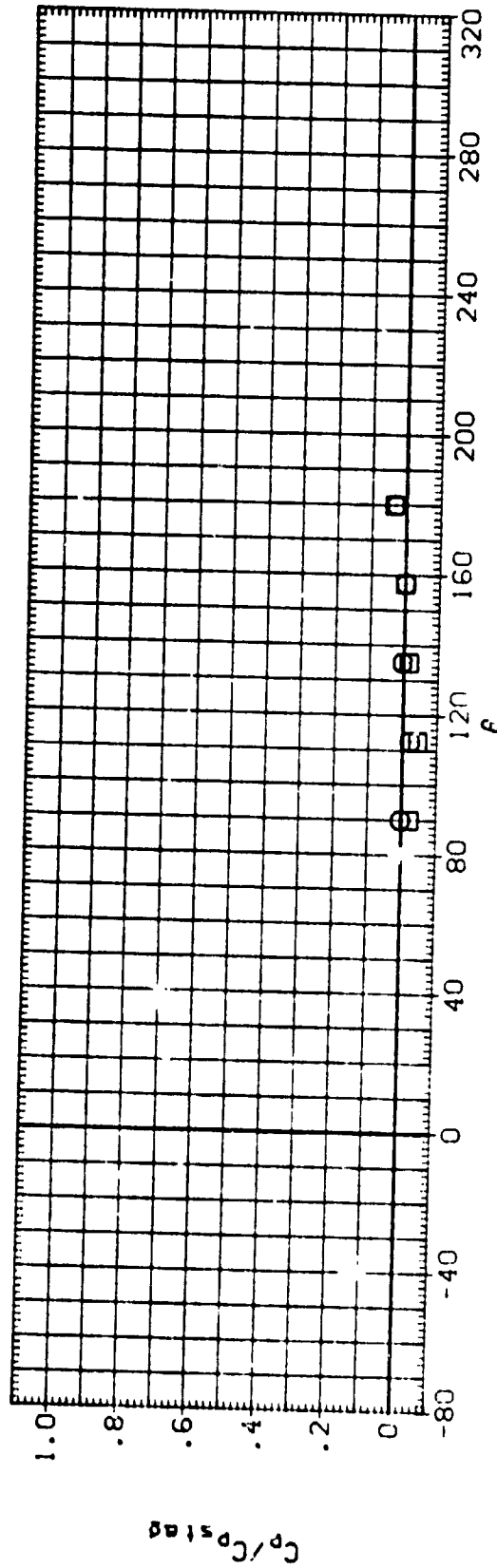
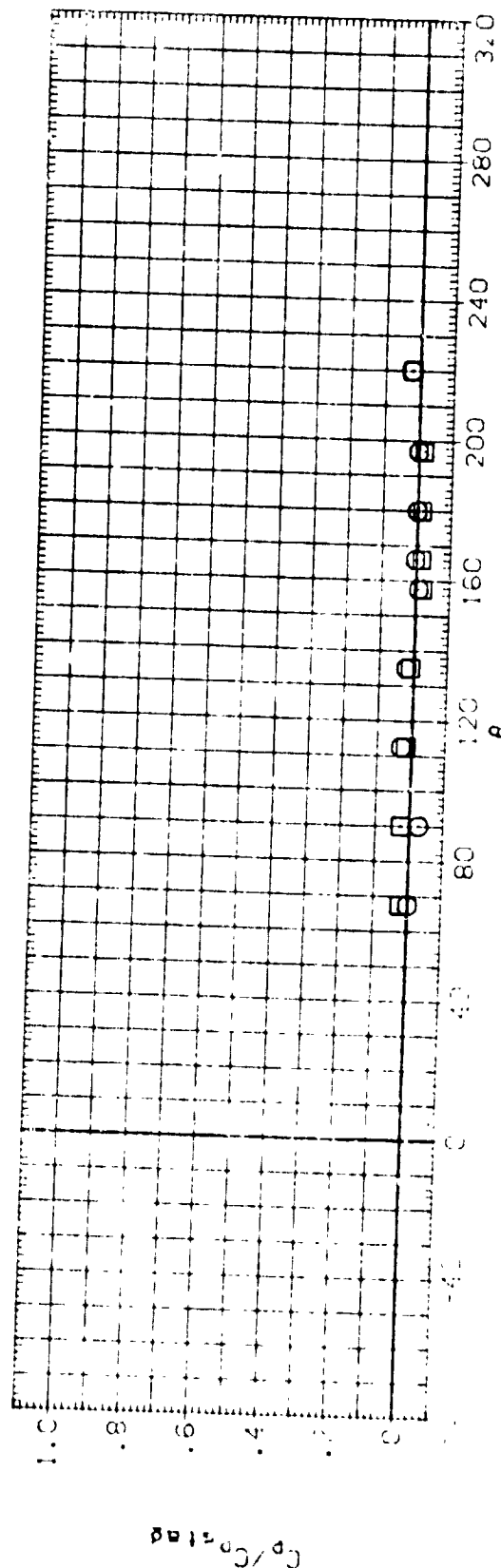
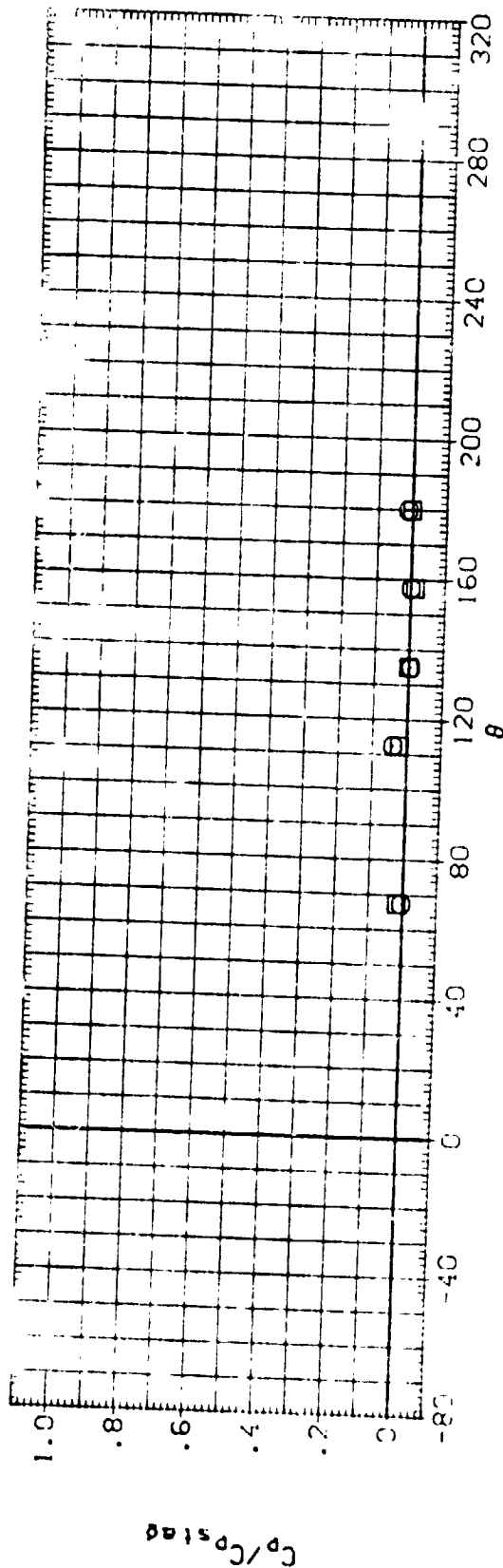


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 5.0

(RQ3TAC) UPWT 1055 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/L T WACH
 .000 .700 950
 5.000 .650

PARAMETRIC VALUES
 RN/L 5.000 E .0



REPRODUCIBILITY OF THE
 ORIGINAL PAGE IS POOR

FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. $BETA = 0$. $RN/L = 5.0$

(R03TAC) UPWT 1059 (114) 01-T15-S8V16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ .000 .800 2.950
 □ 5.000 .750

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

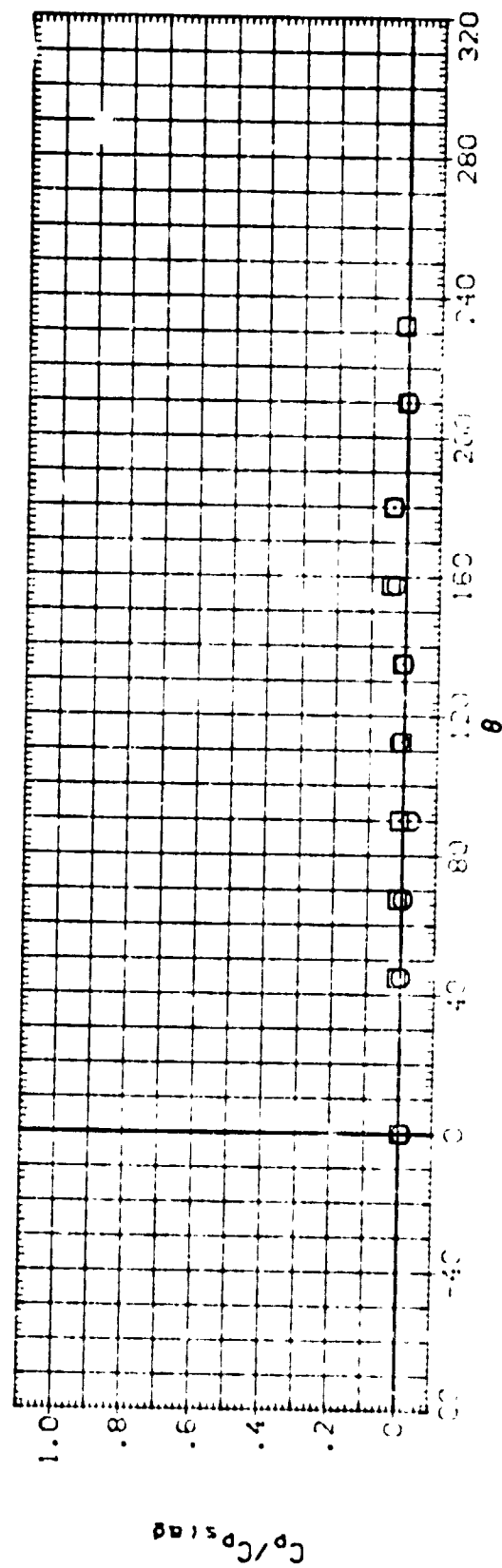
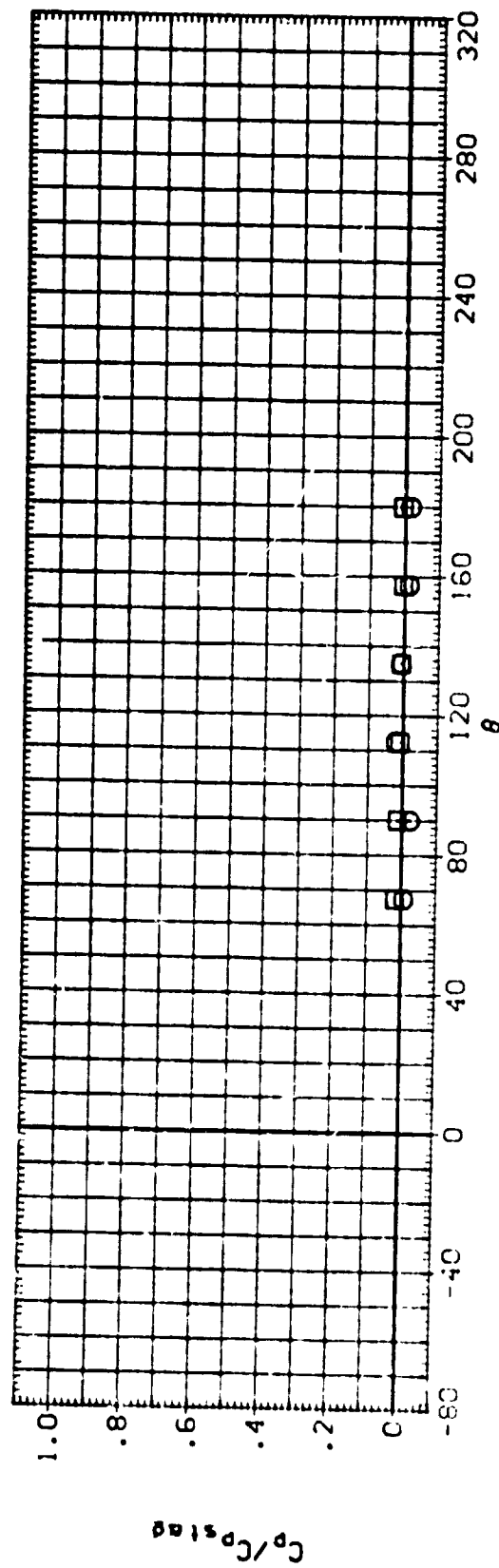


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 5.0

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 000 .900 2.950
 5.000 .850

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

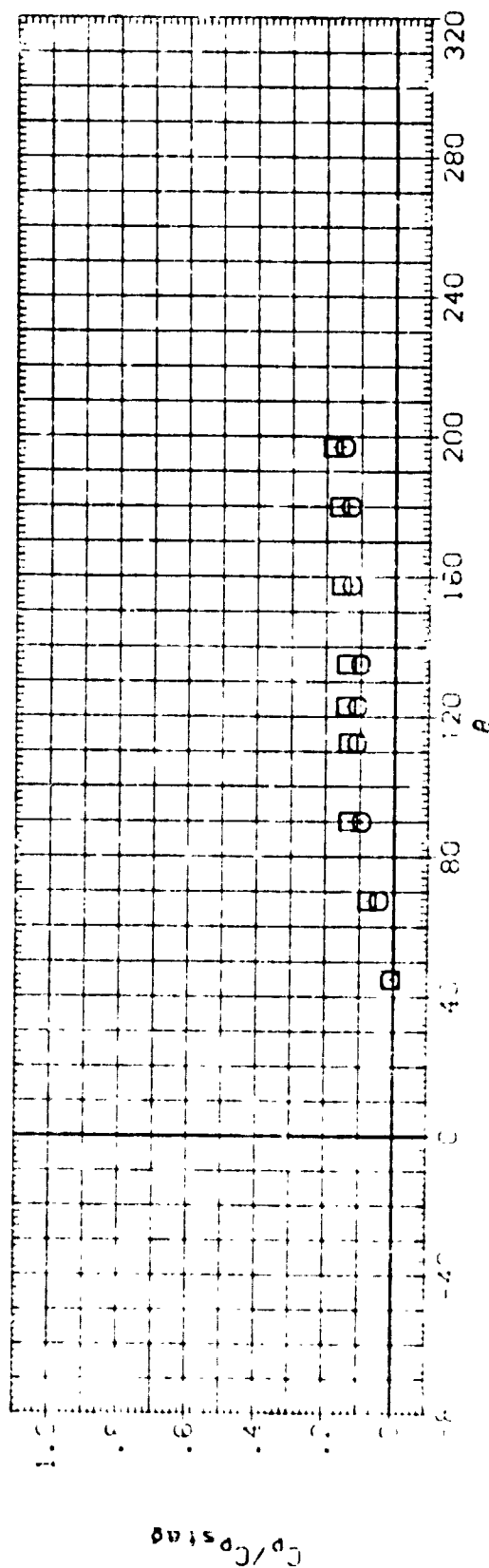
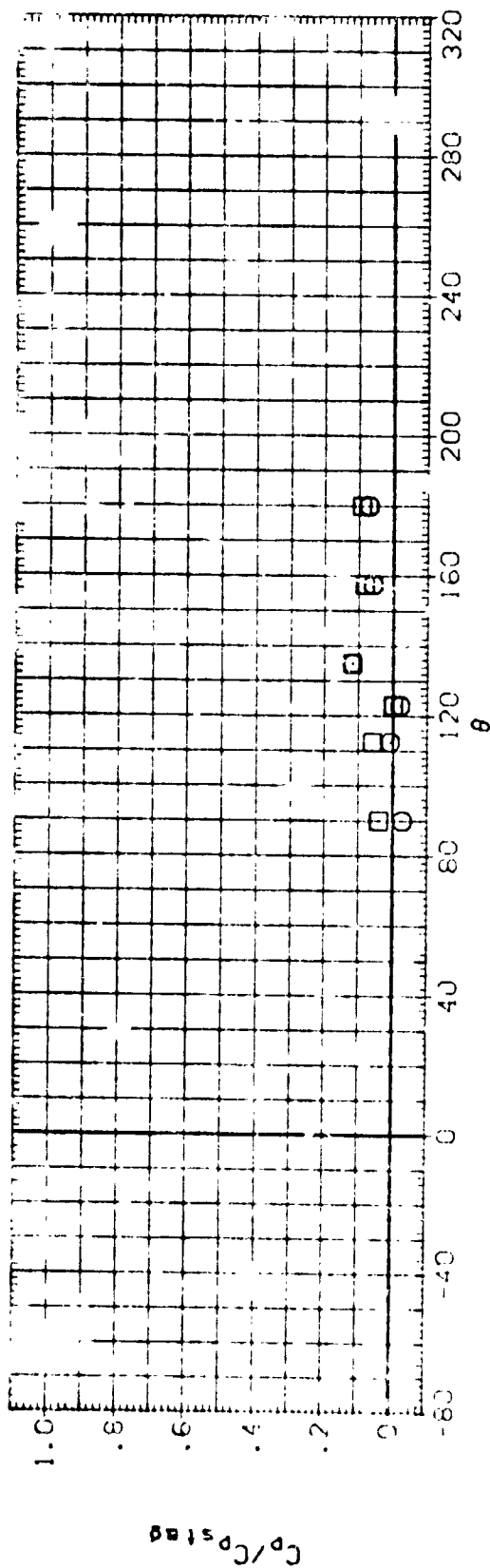


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 0. RN/L = 5.0

C-5

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA
-5.000
.000

X/LT MACH
.350 3.700

PARAMETER VALUES
5.000 BETA

RN/L

.000

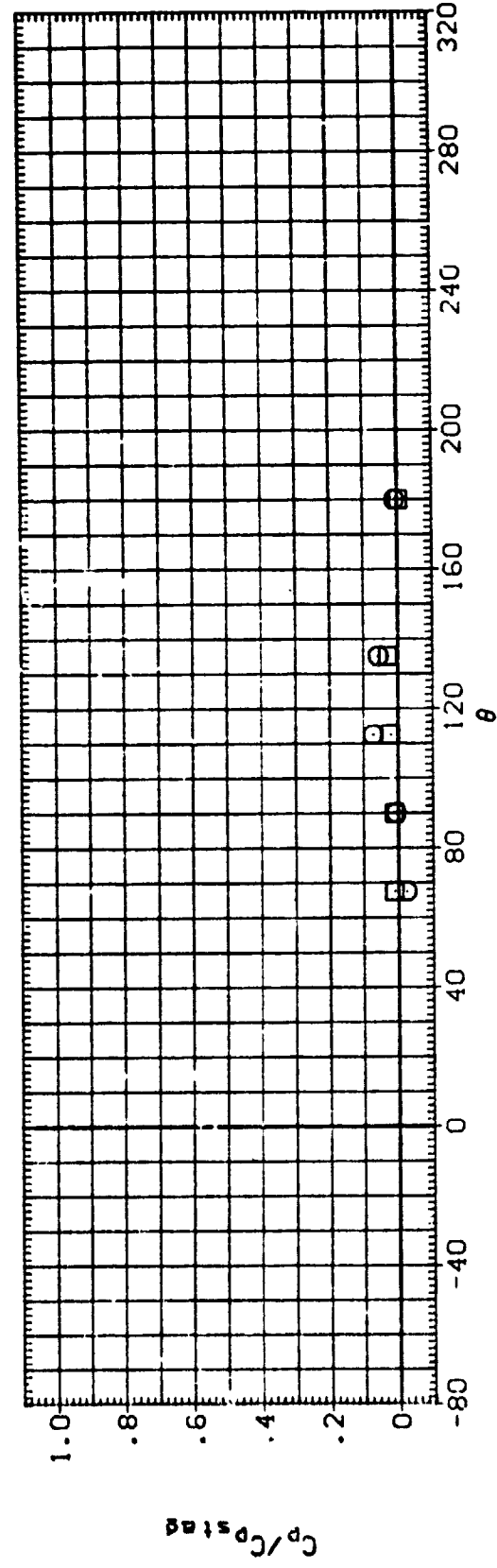
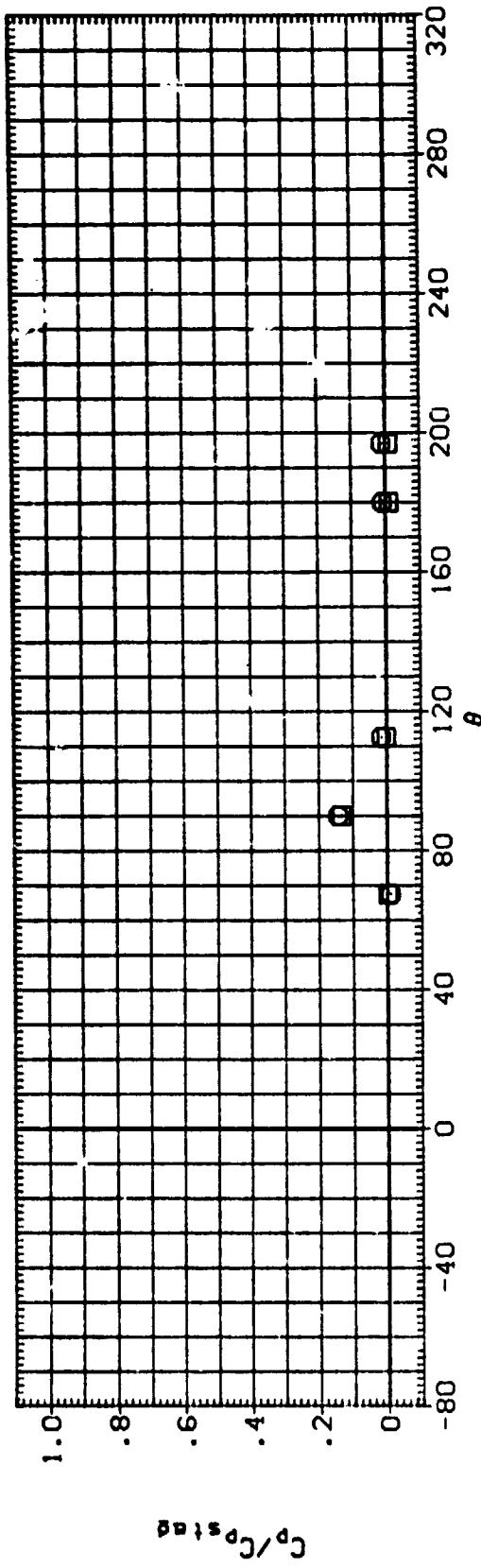


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -5.000 .500 3.700

PARAMETRIC VALUES
 RN/L BETA .000

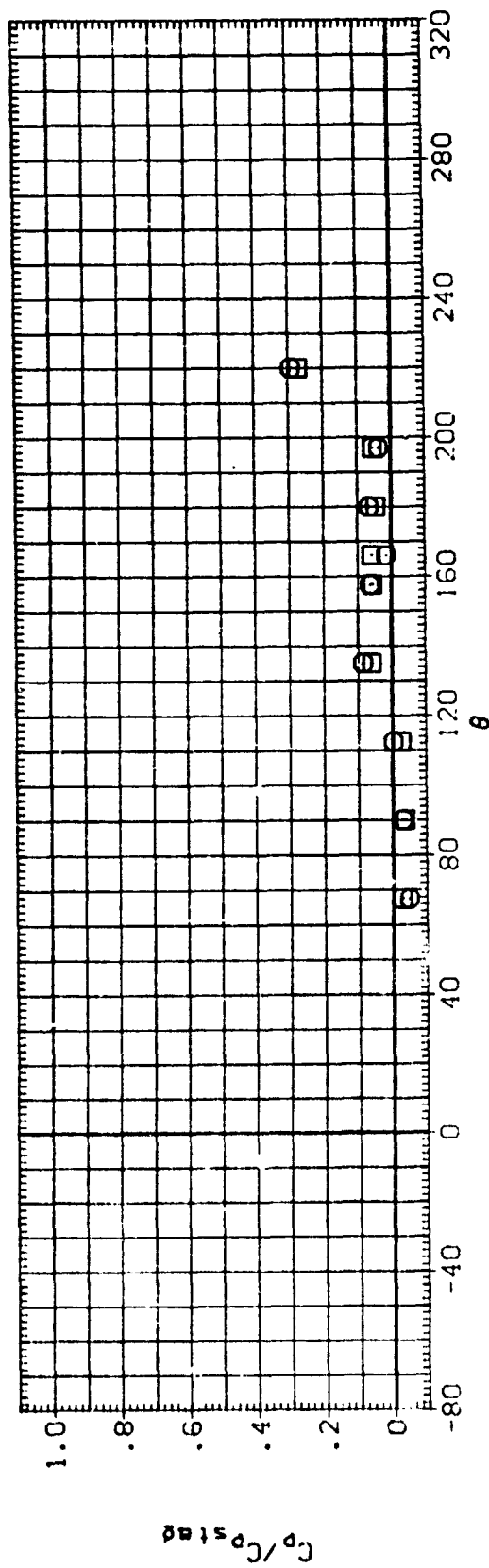
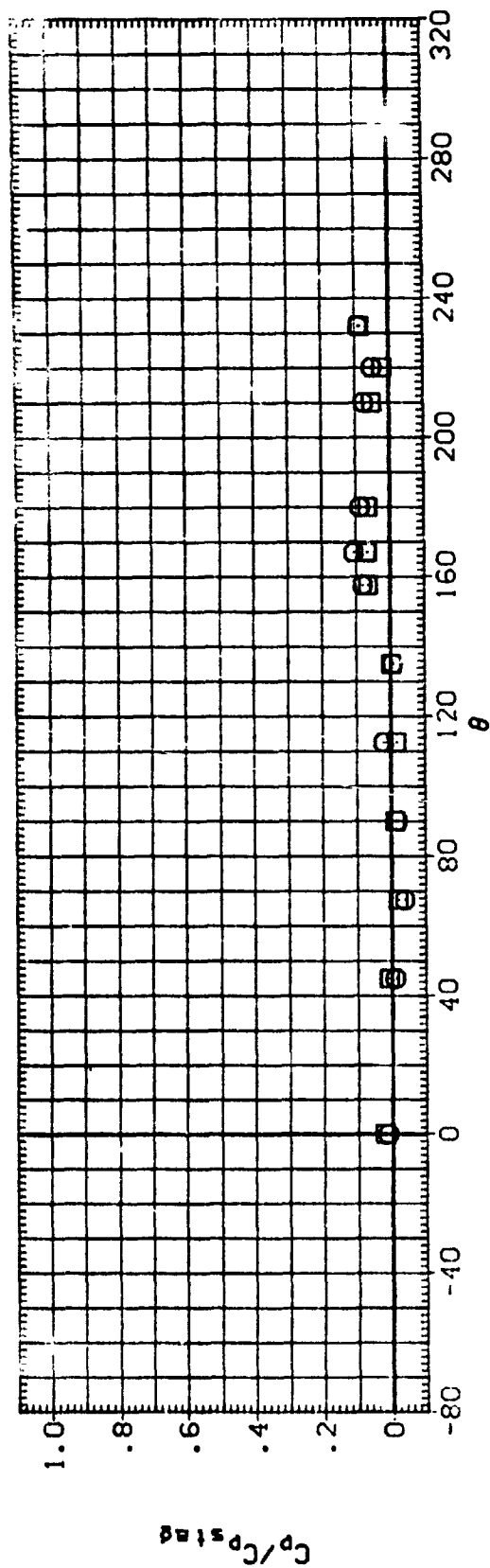


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK. BETA= 0. RN/L= 5.0

[R03TAC] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL

ALPHA

X/LT

MACH

3.700

.600

.000

.550

PARAMETRIC VALUES

5.000

BETA

.000

□

RN/L

5.000

BETA

.000

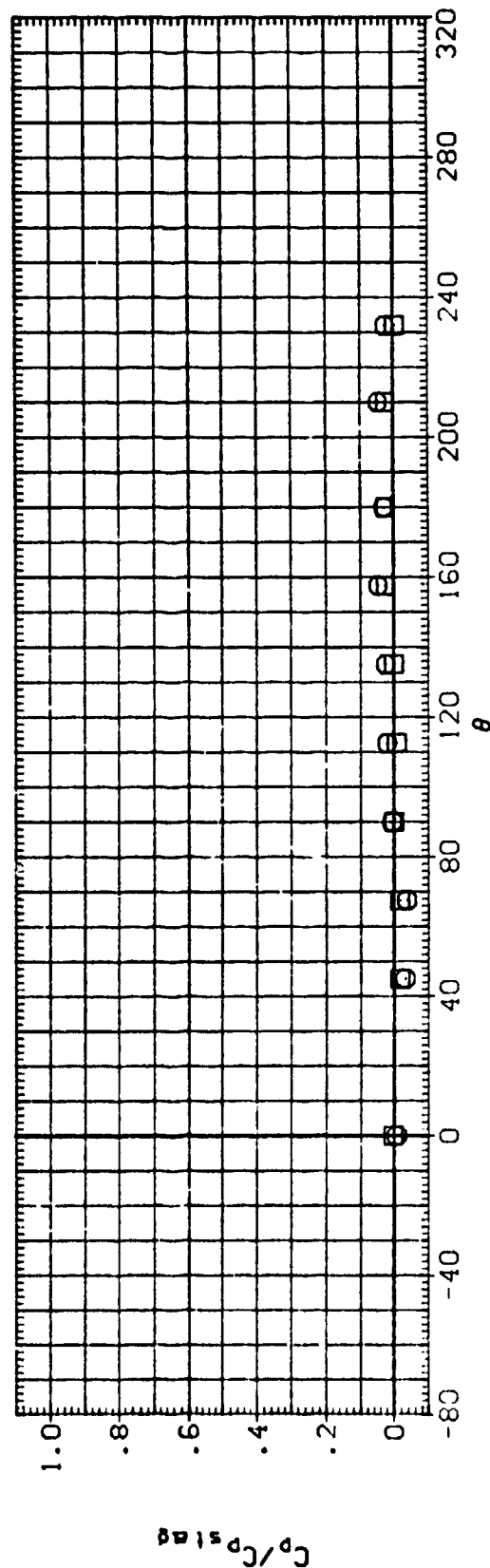
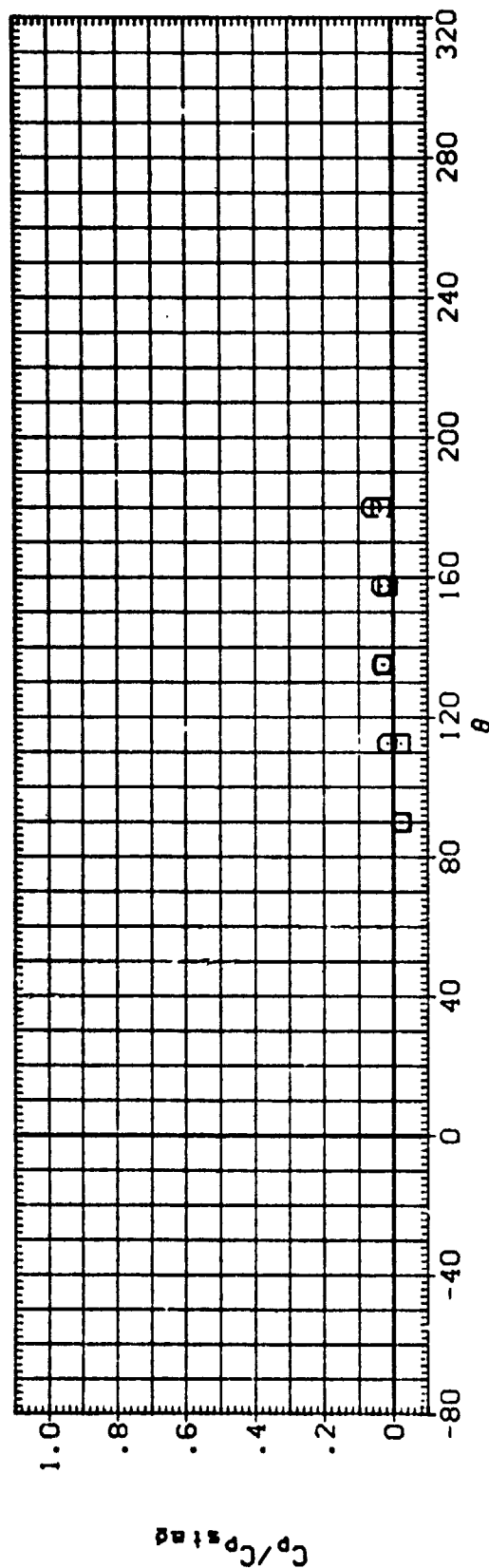


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA
-5.000 .000

X/LT .700
RN/L 3.700

PARAMETRIC VALUES
5.000 BETA .000

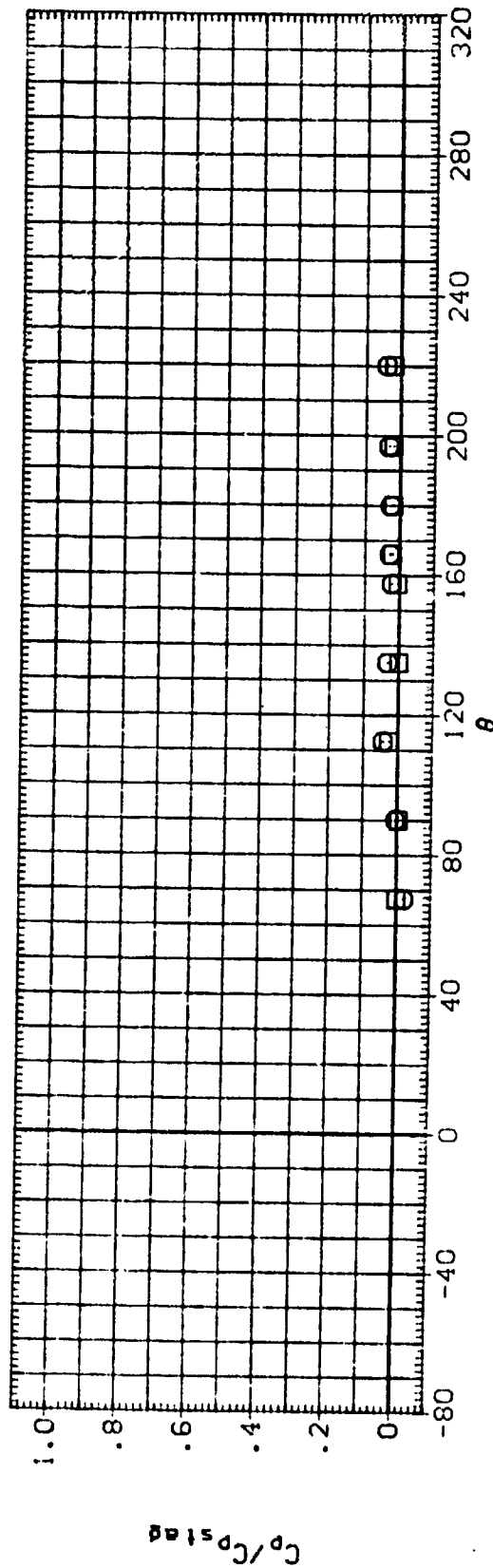
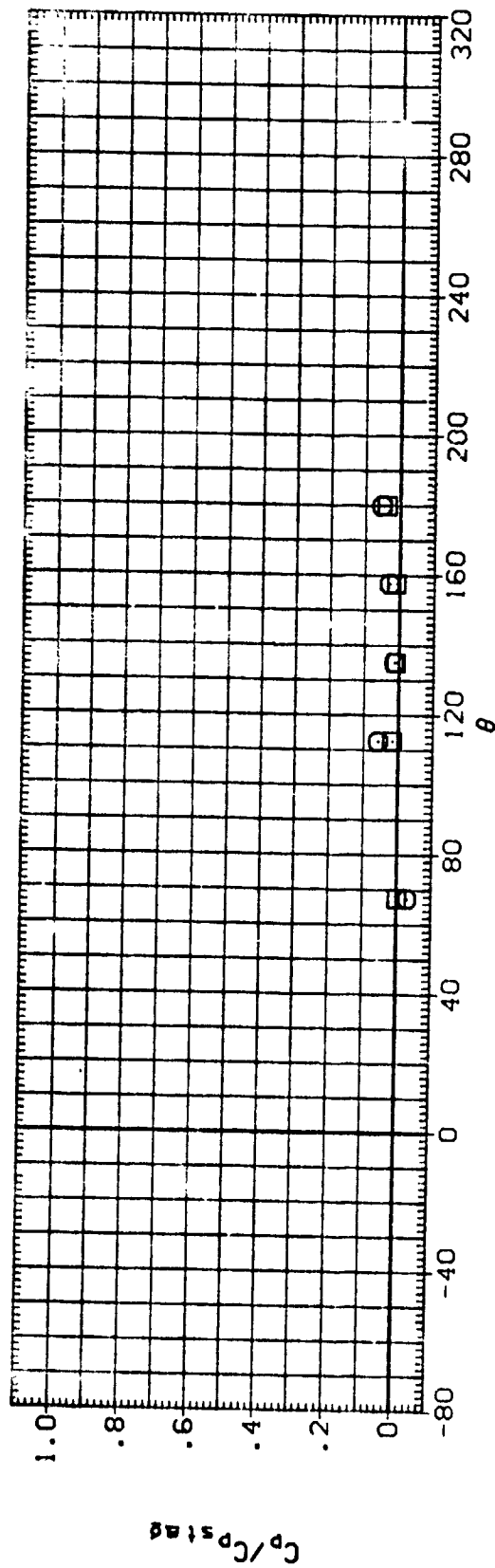


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.800	3.700		5.000 BETA .000
	.000	.750			

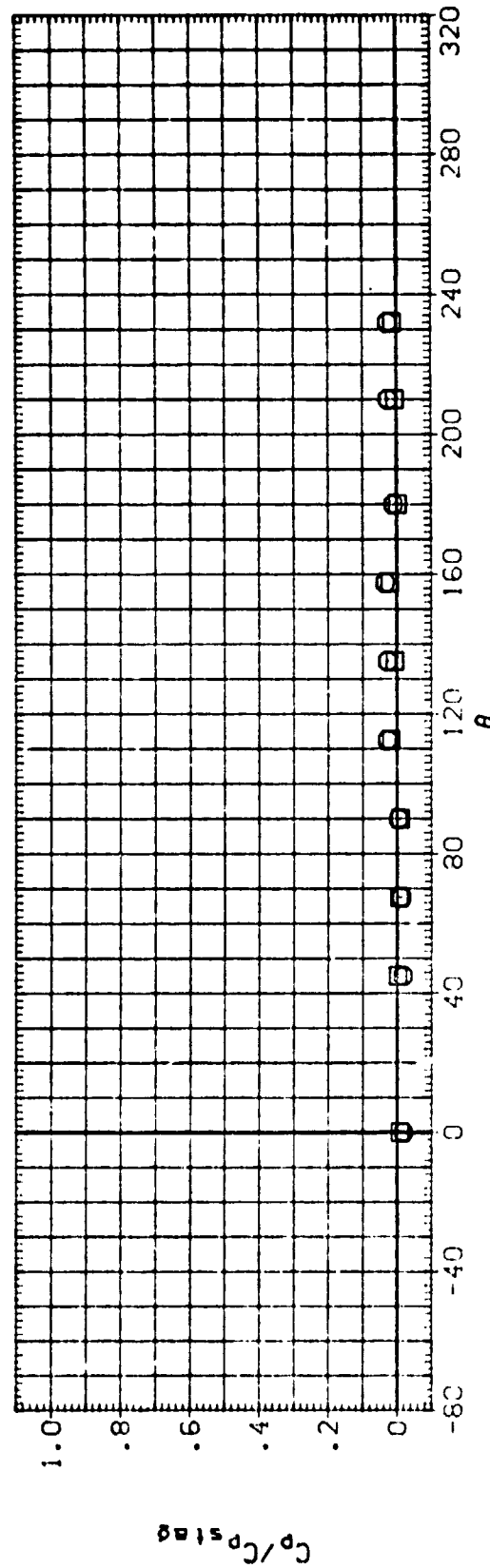
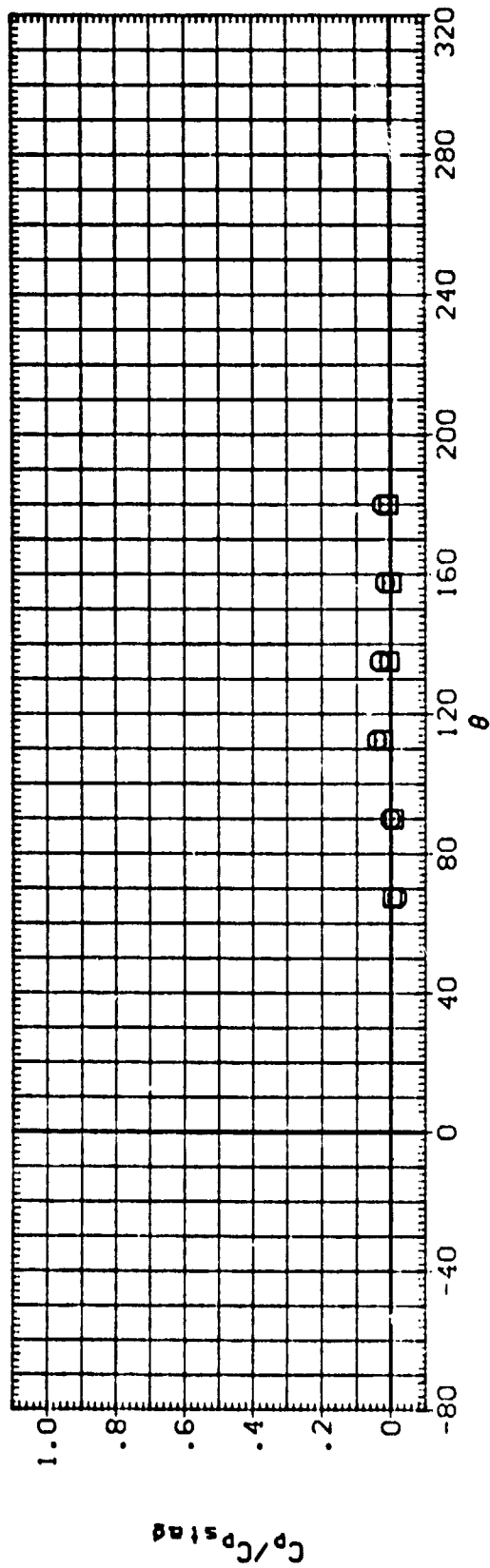


FIG. 26 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ -5.000 .900 3.700

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

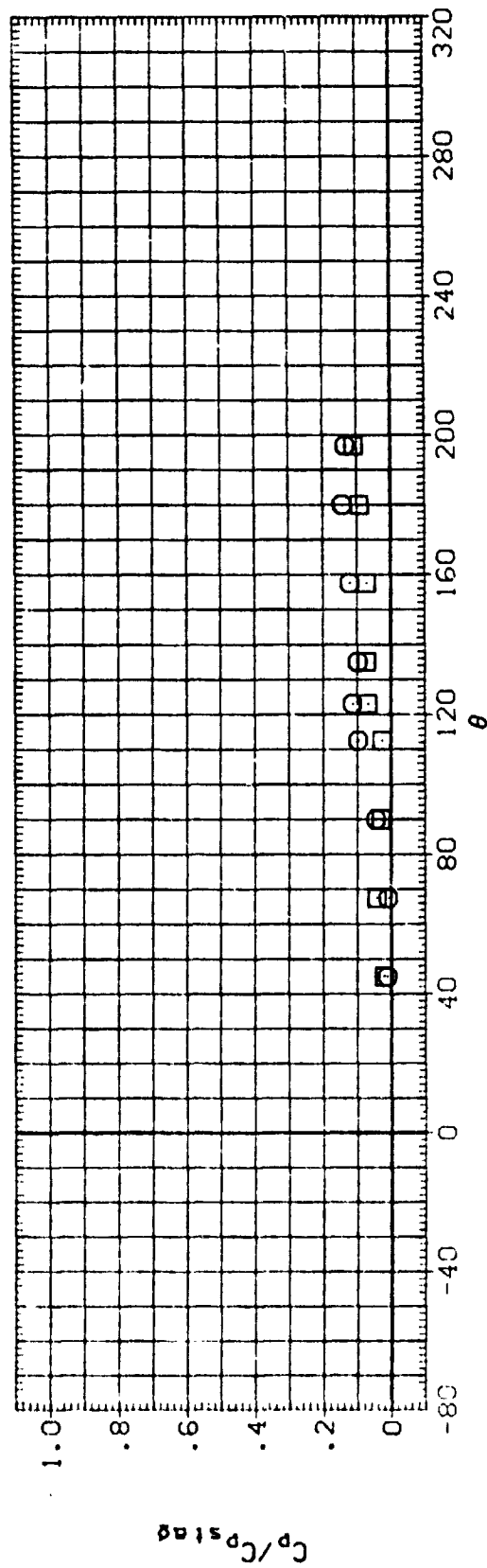
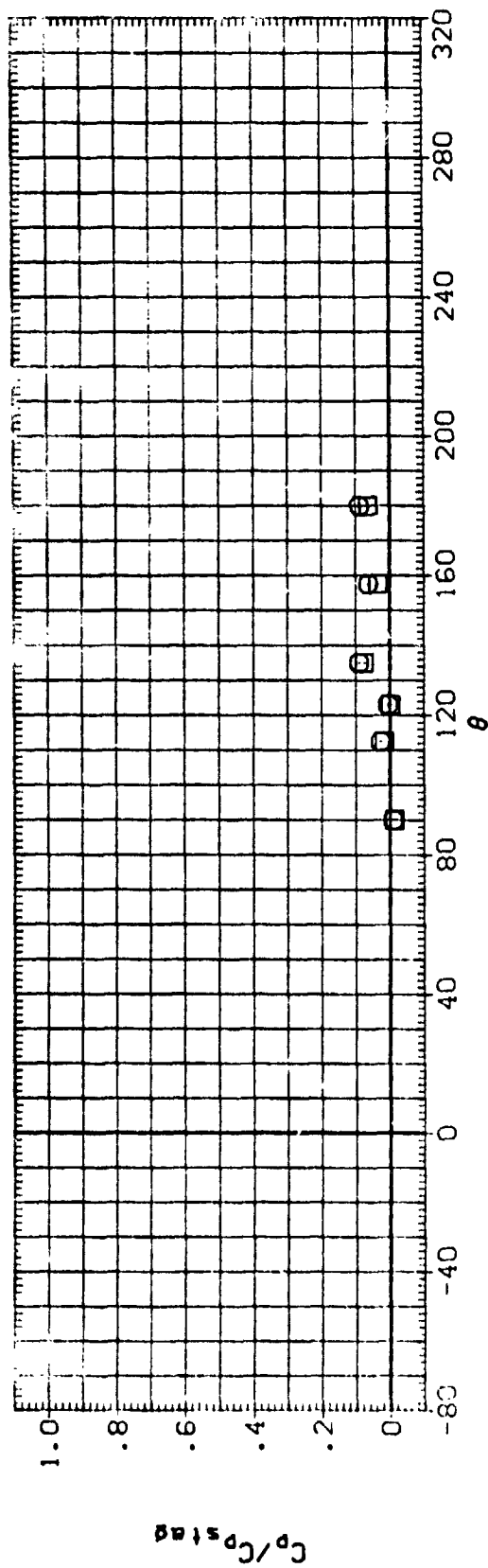


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.350	4.600		5.000 BETA .000
□	.000	.300			

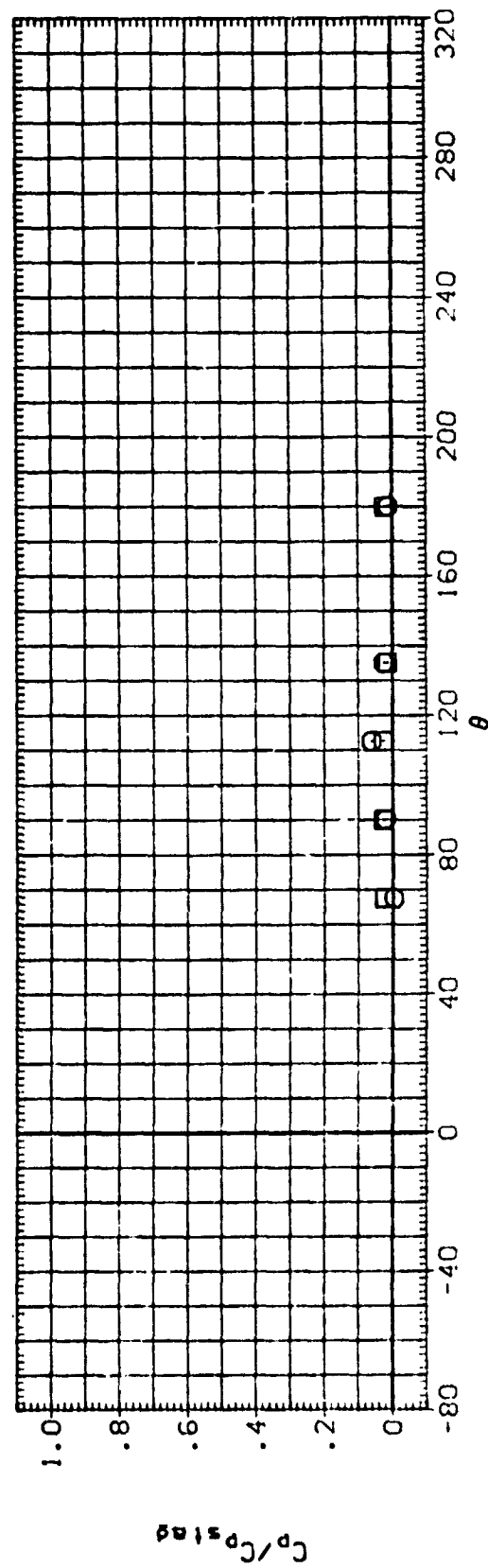
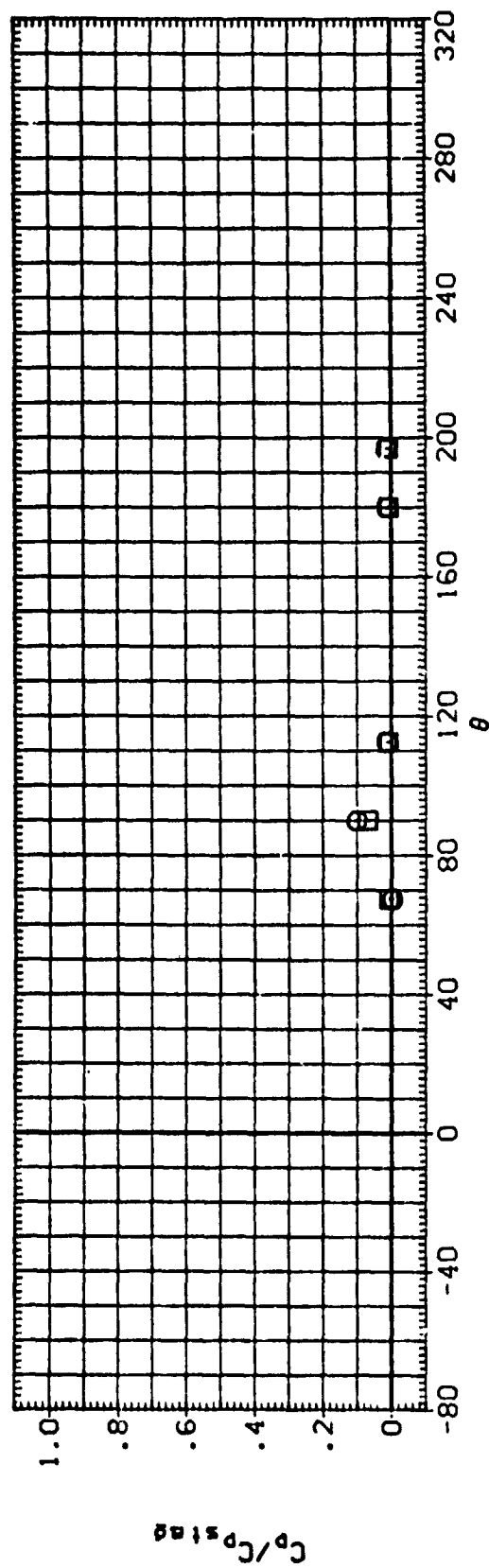


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 8 -5.000 .500 4.600

PARAMETRIC VALUES
 5.000 BETA .00

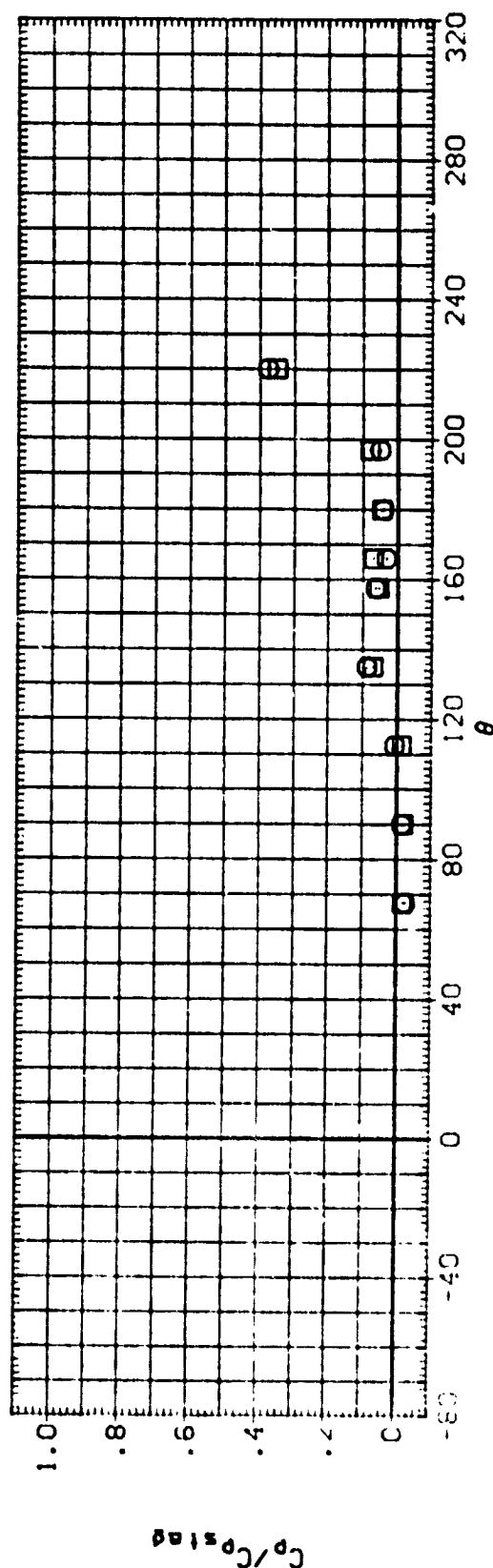
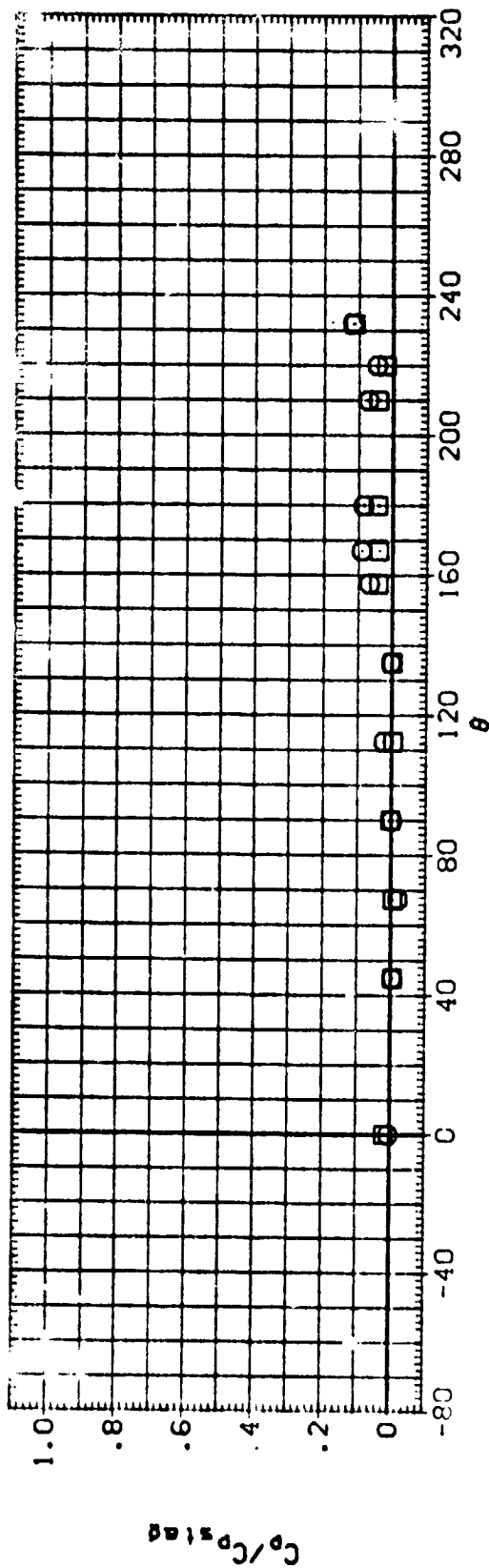


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) LPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES

RN/L

5.000

BETA

.000

MACH

4.600

X/LT

.600

ALPHA

-5.000

□

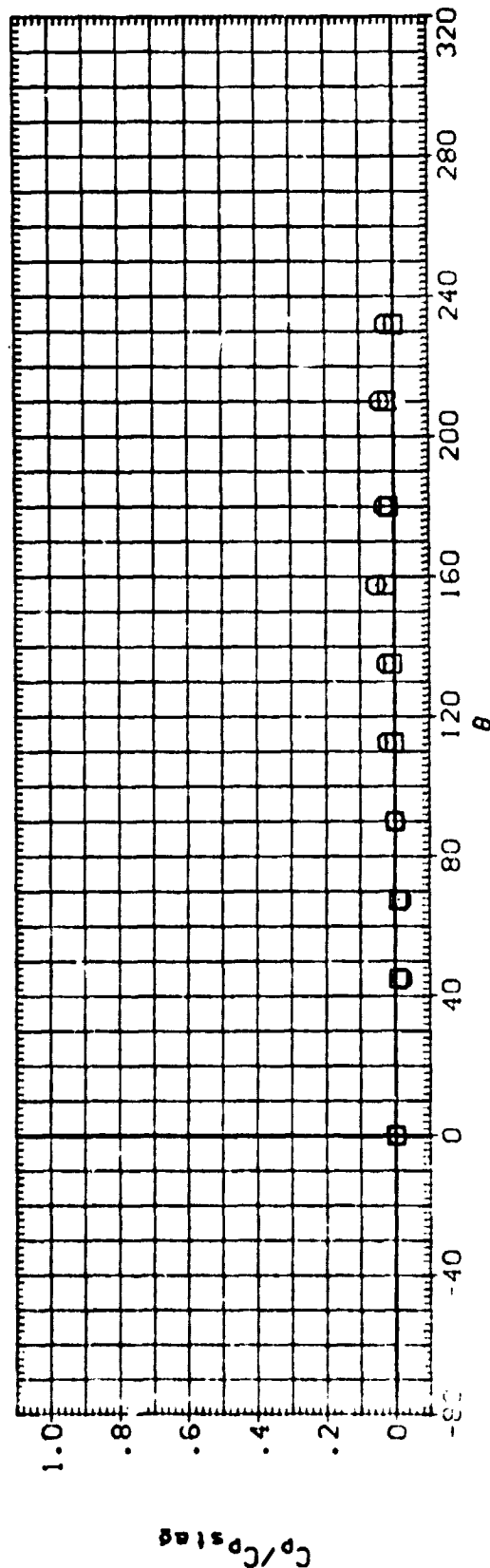
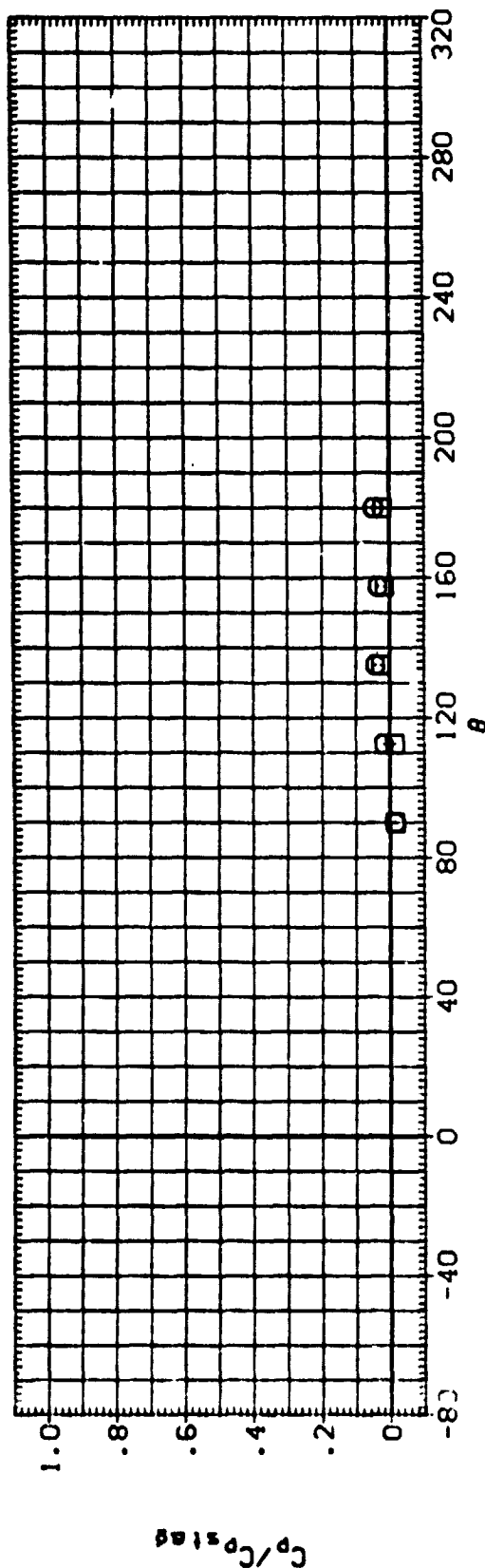


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) C1-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -5.000 .700 4.600
 .000 .650

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

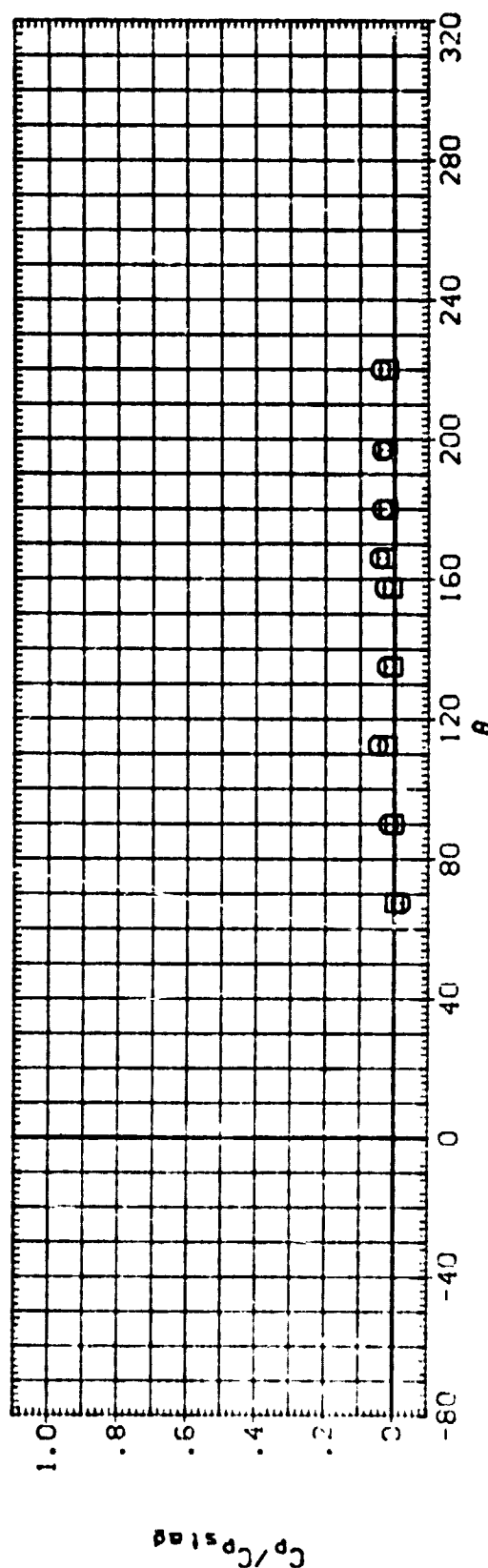
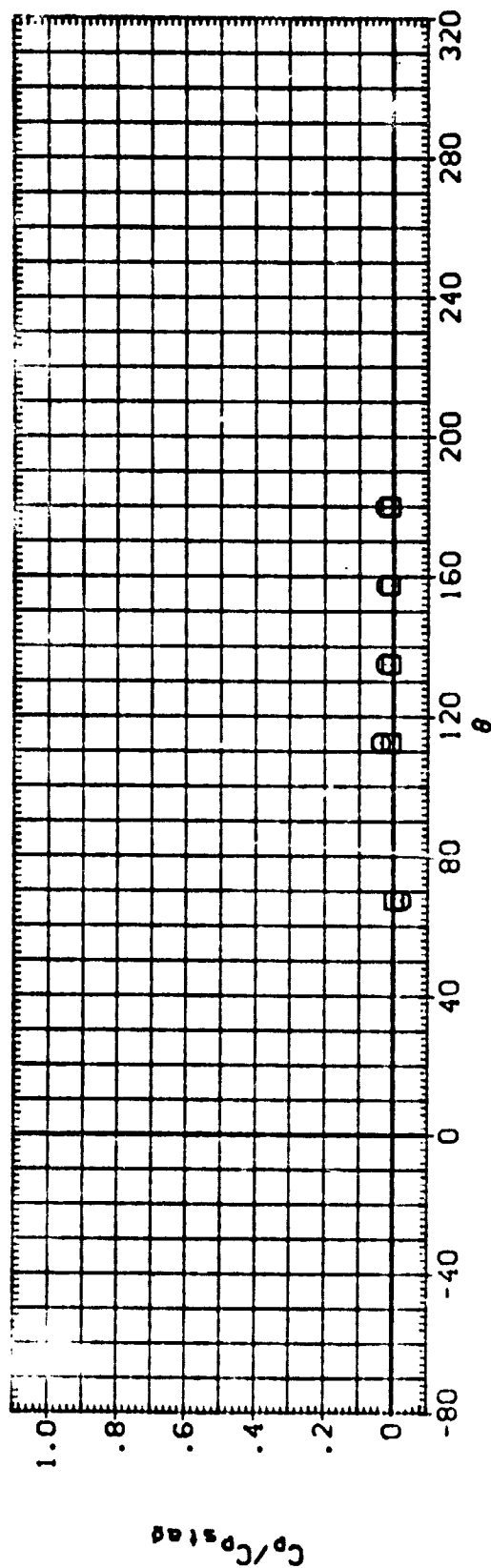


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(RQ3TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH

-5.000 .800 4.600
 .000 .750

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

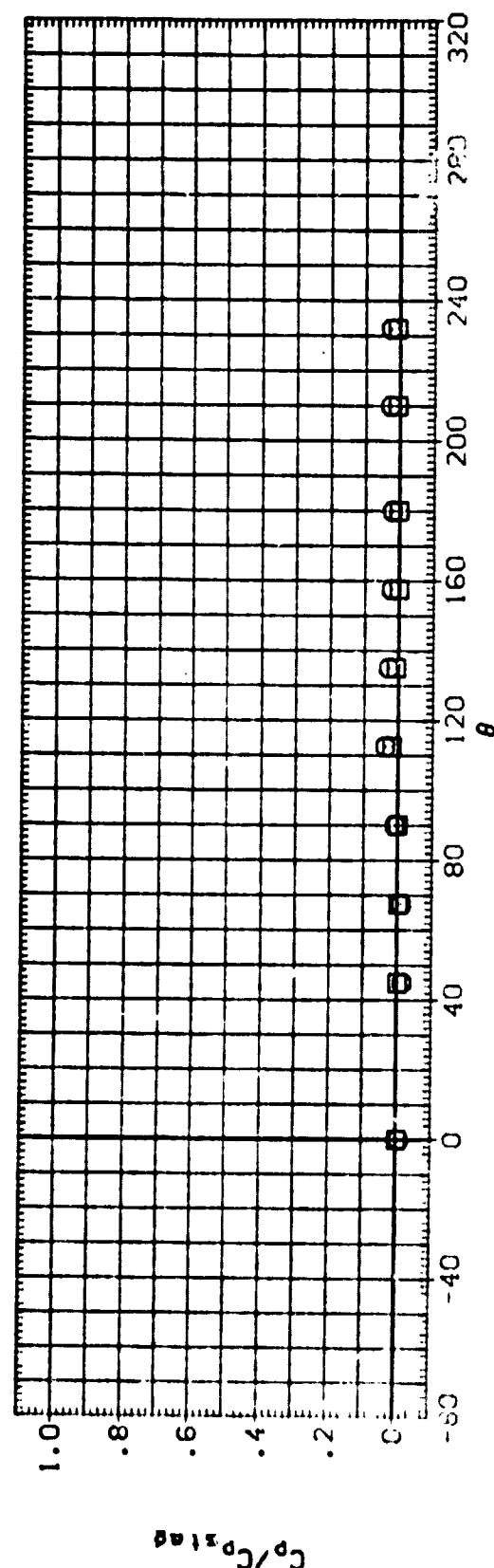
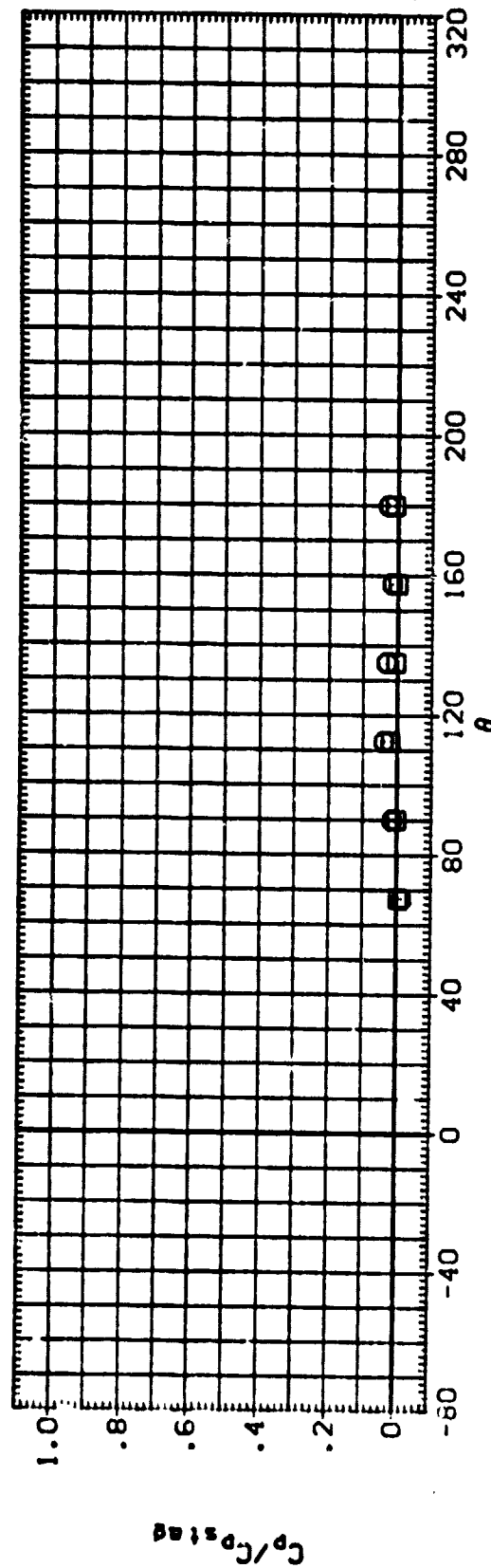


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03TAC) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	X/LT	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.900	4.500		5.000 BETA .000
	.000	.850			

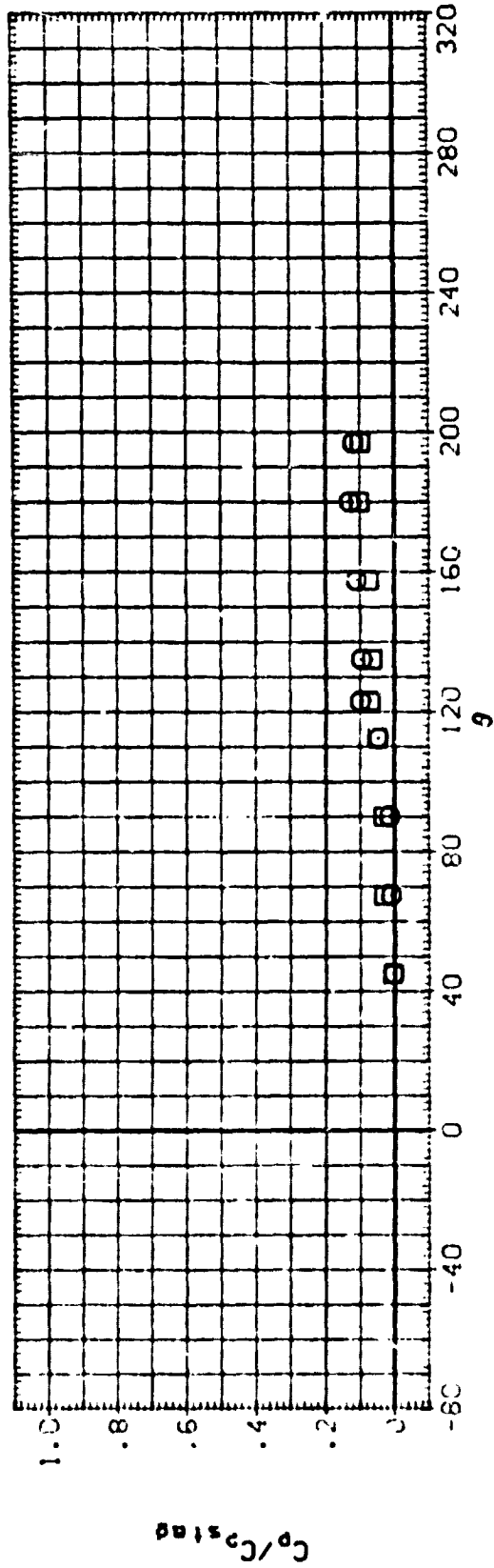
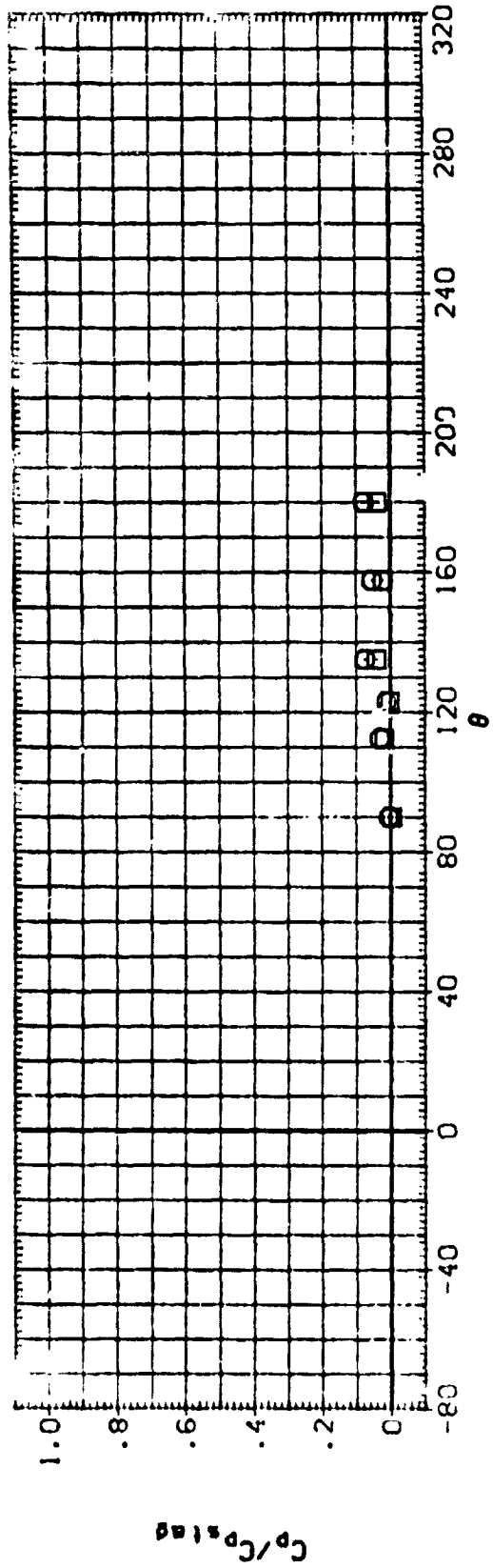


FIG. 26 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 0. RN/L= 5.0

(R03SAC) UPWT 1059 (1H4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 0 .000 180.000 2.950
 5.000 90.000

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

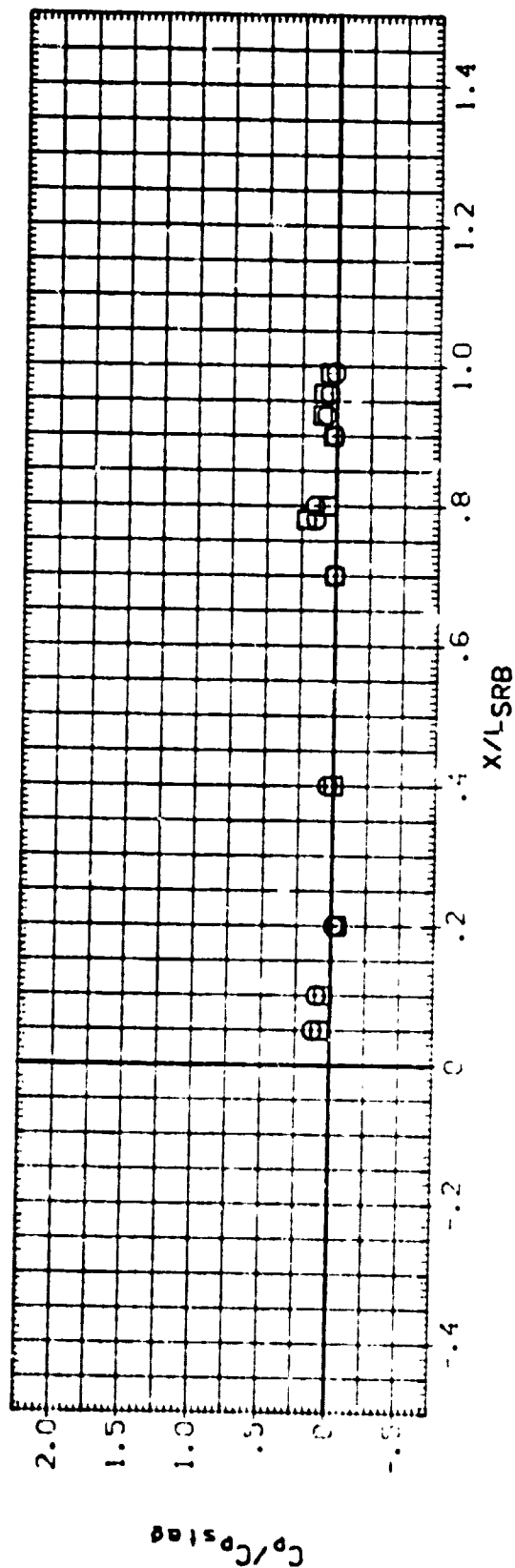
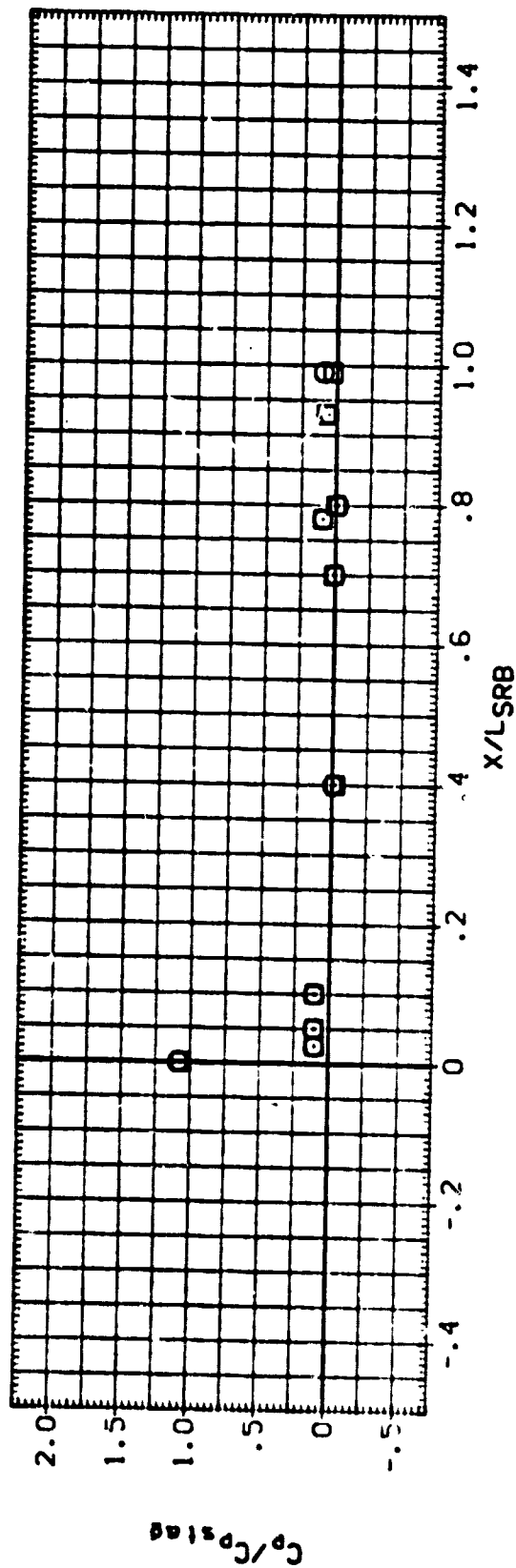


FIG. 27 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

[R03SAC] UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL 

ALP-IA
5.000

PSI
225.000
210.000

MACH
2.950

PARAMETRIC VALUES
5.000 BETA

RN/L

0.000

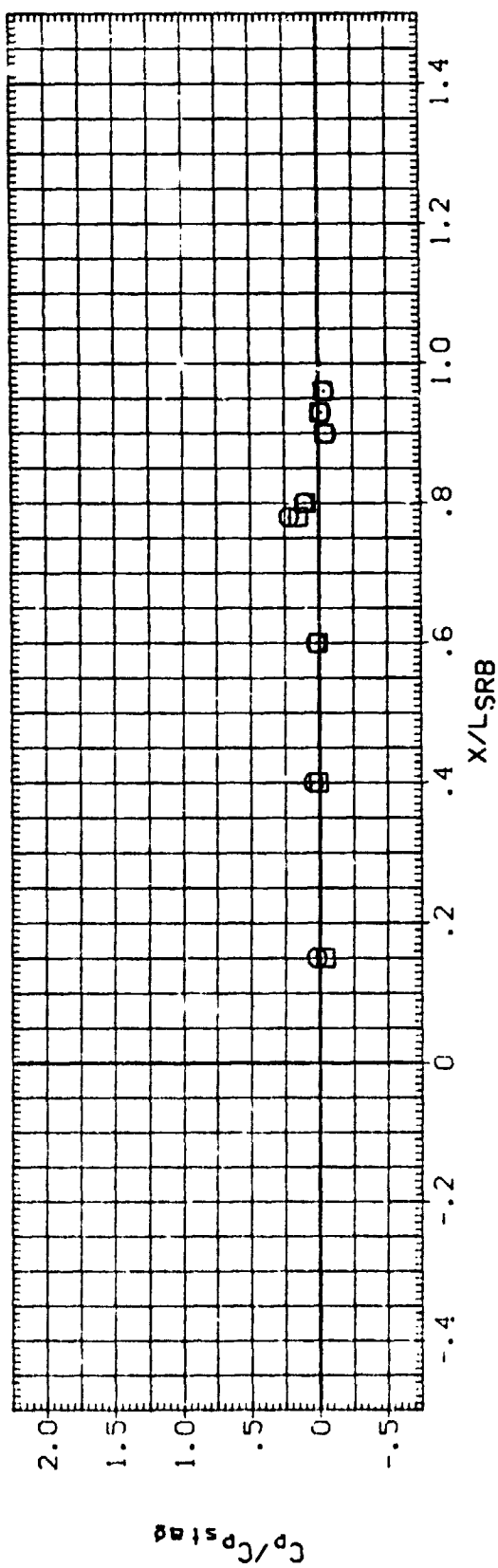
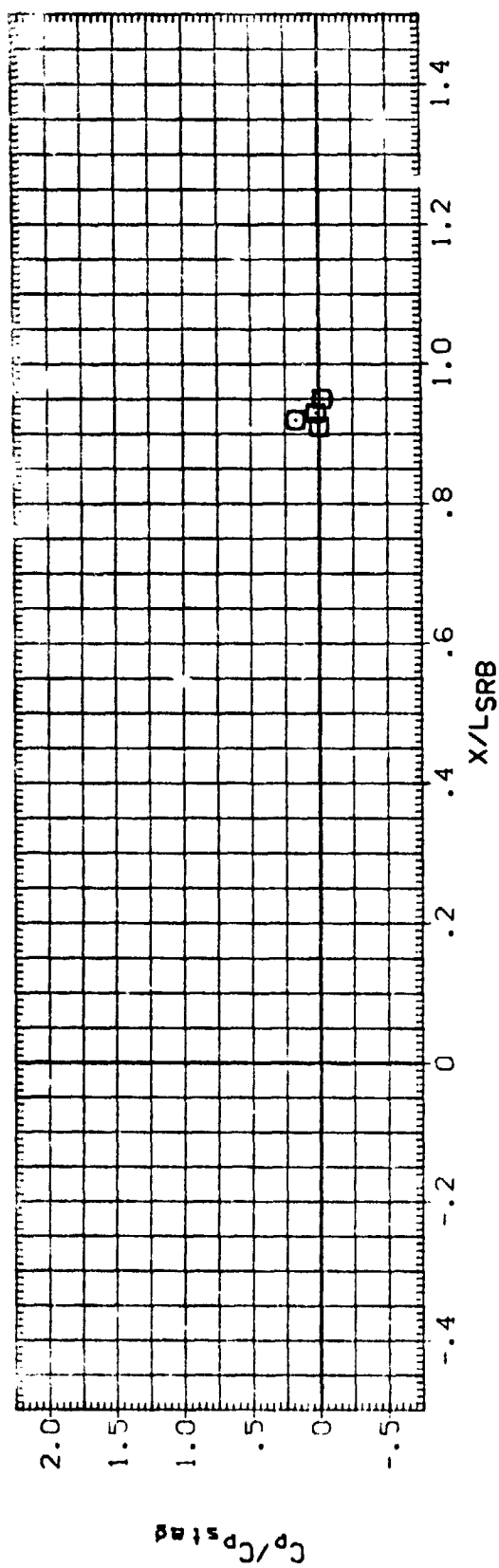


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

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(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 8 .000 770.000 2.950
 5.000 247.500

PARAMETRIC VALUES
 5.000 BETA .000
 RN/L

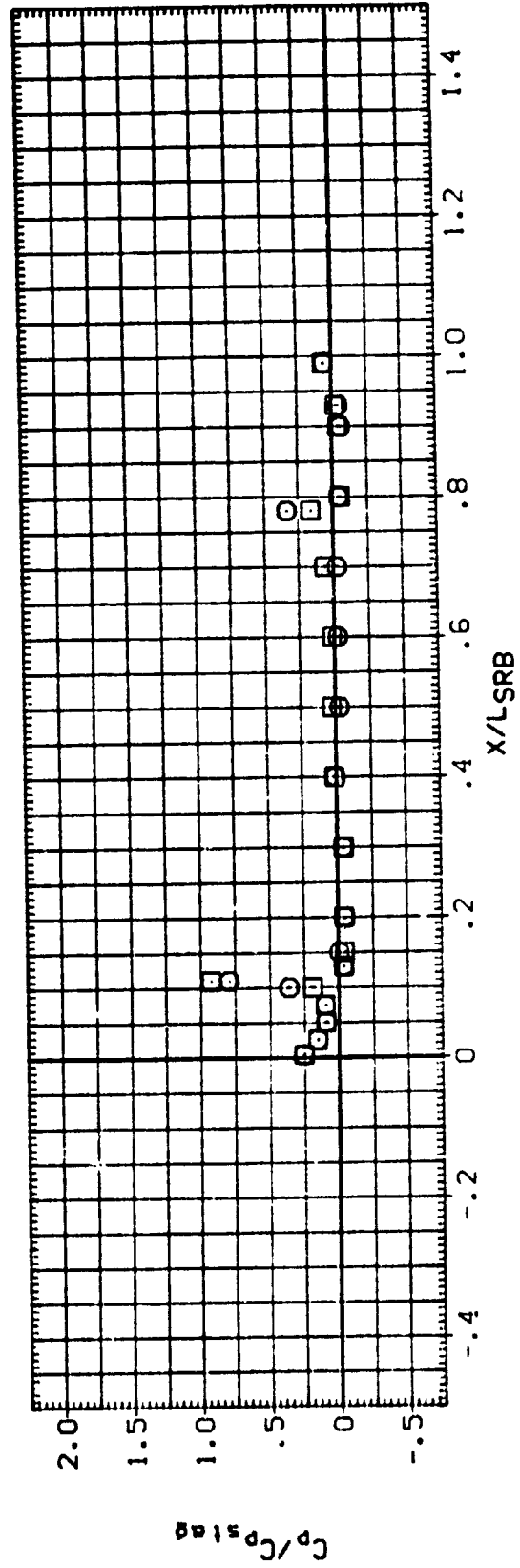
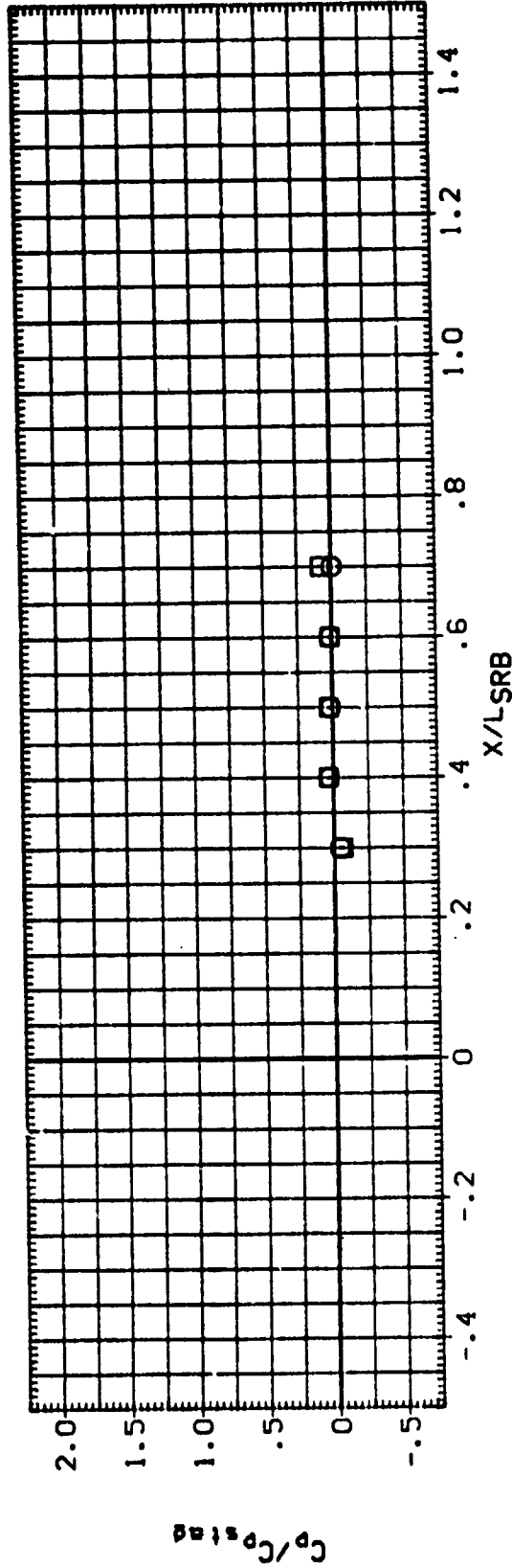


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER, BETA= 0. RN/L= 5.0

(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 □ -5.000 180.000 3.700
 □ 90.000

PARAMETRIC VALUES
 RN/L 5.000 BETA 0.0

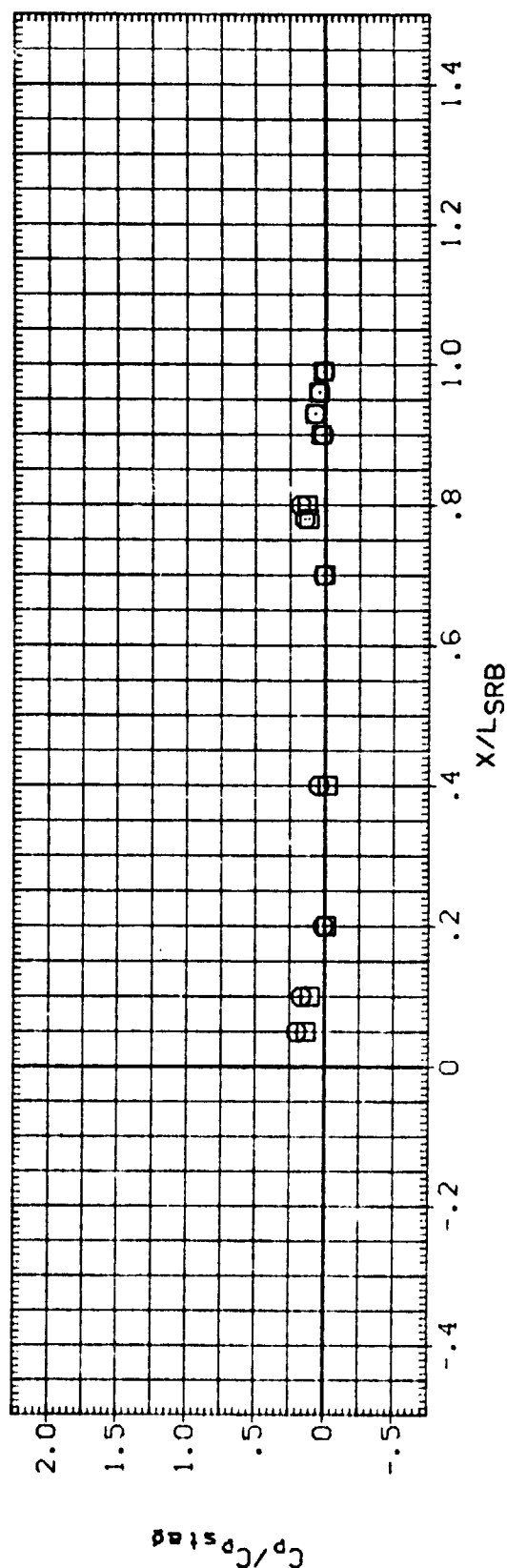
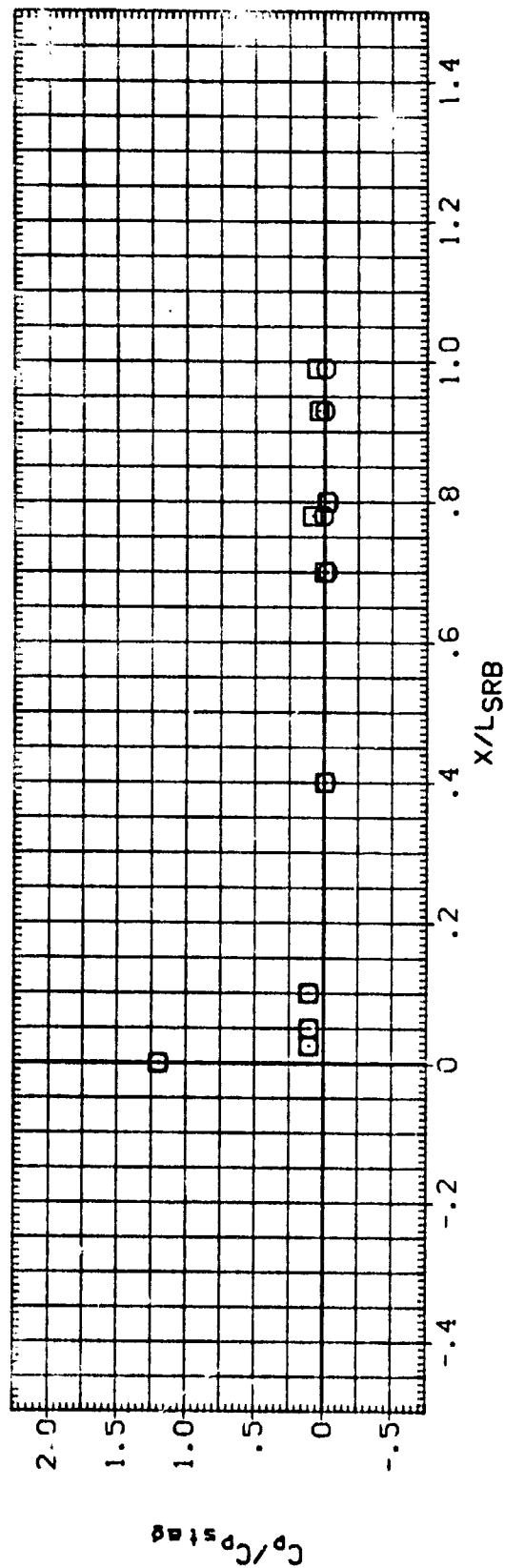


FIG. 27 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. $RN/L= 5.0$

(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	PSI	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	225.000	3.700	5.000	BETA .000
□	.000	210.000			

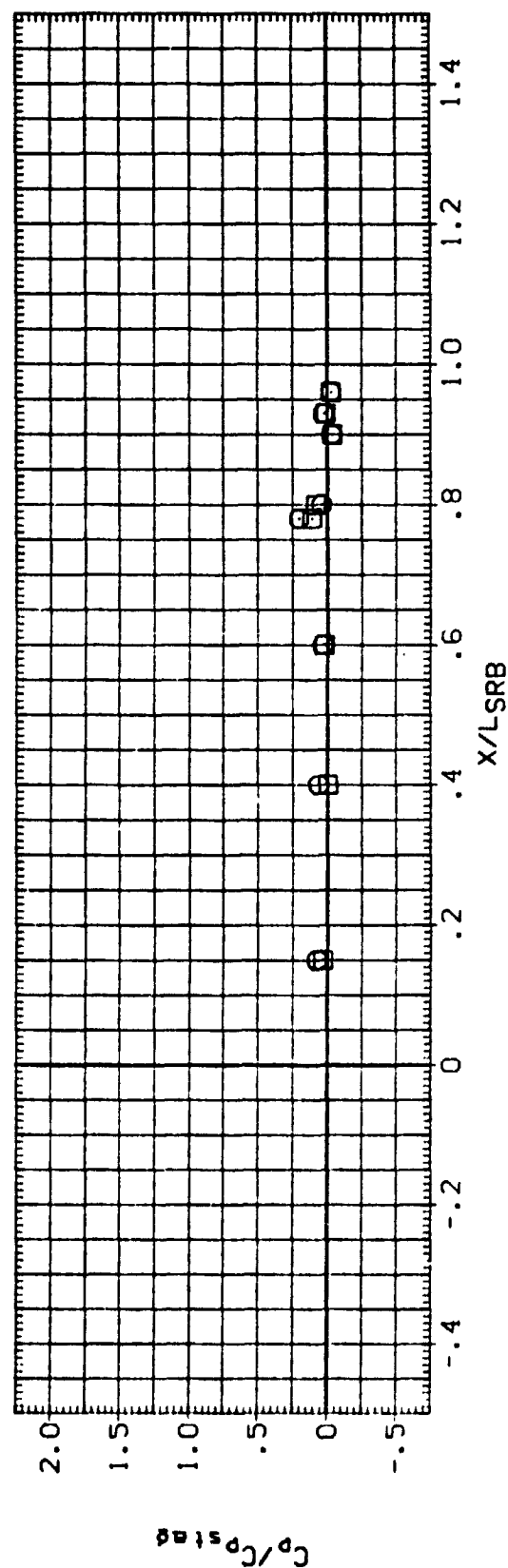
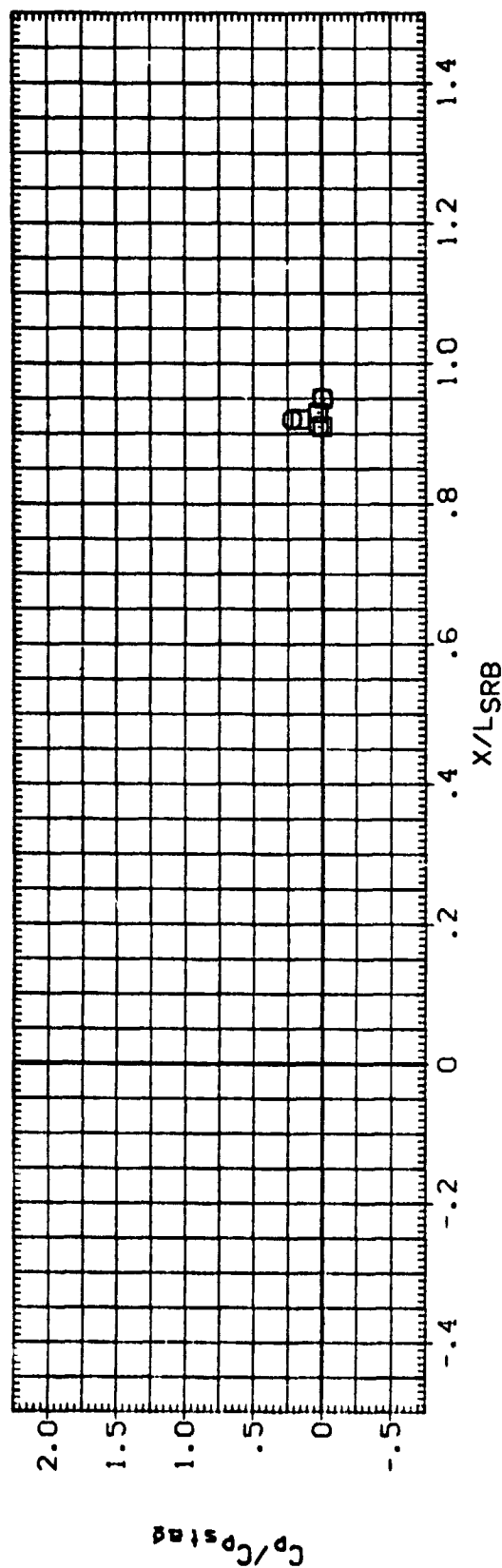


FIG. 27 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

(R03SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSIR.

SYMBOL ALPHA PSI MACH
 -5.000 270.000 3.700
 .000 247.500

PARAMETRIC VALUES
 5.000 BETA .000

RN/L

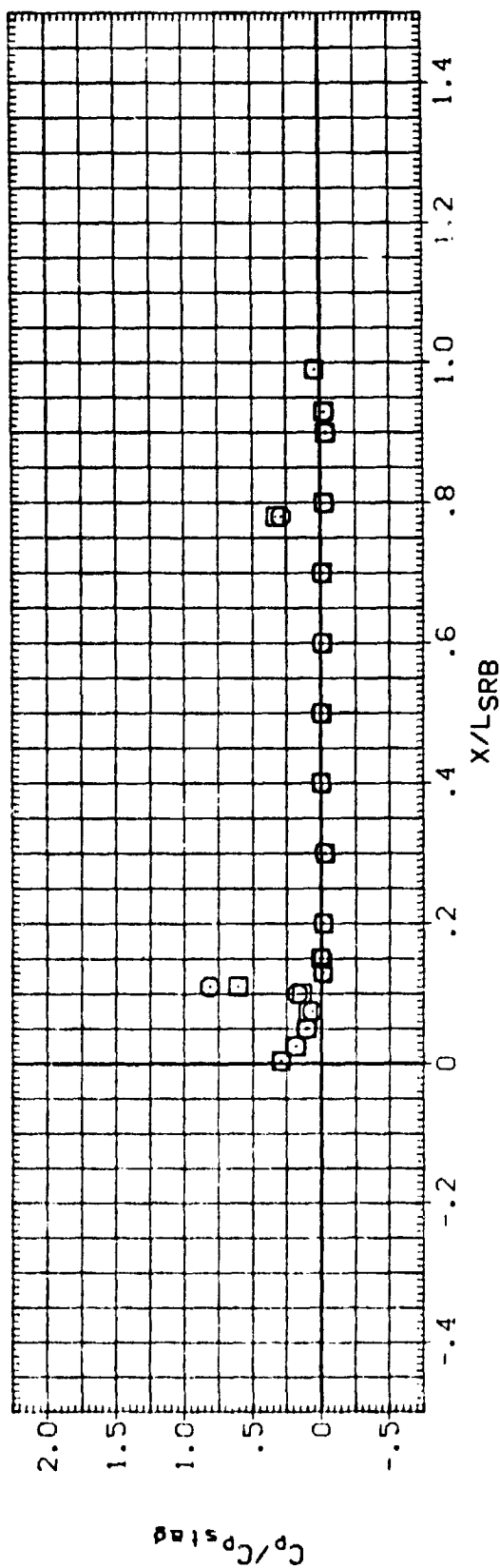
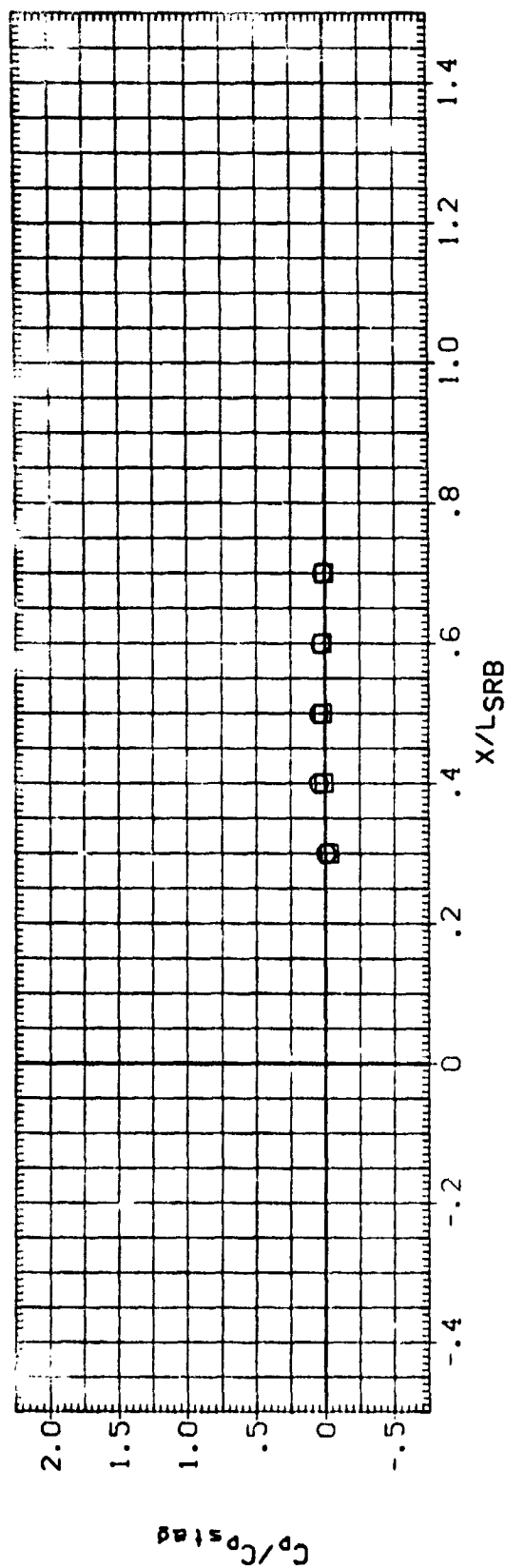


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, BETA= 0, RN/L= 5.0

(R03SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.
 SYMBOL ALPHA PSI MACH
 -5.000 180.000 4.600
 .000 90.000
 PARAMETRIC VALUES
 RN/L 5.000 BETA .000

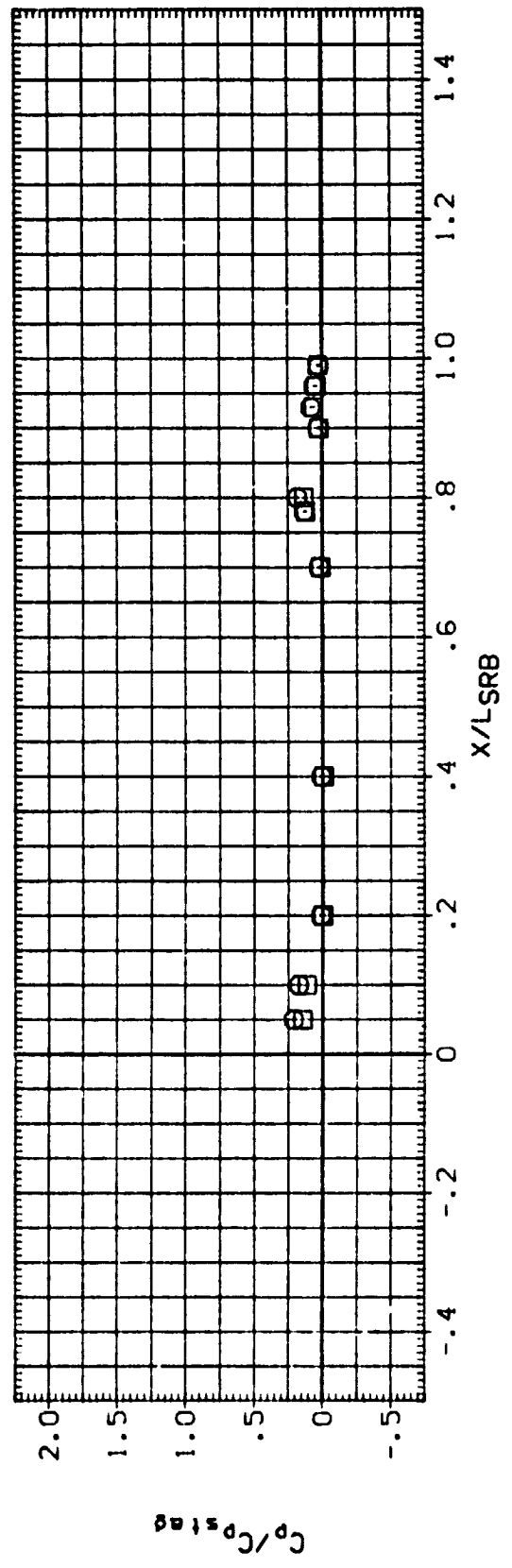
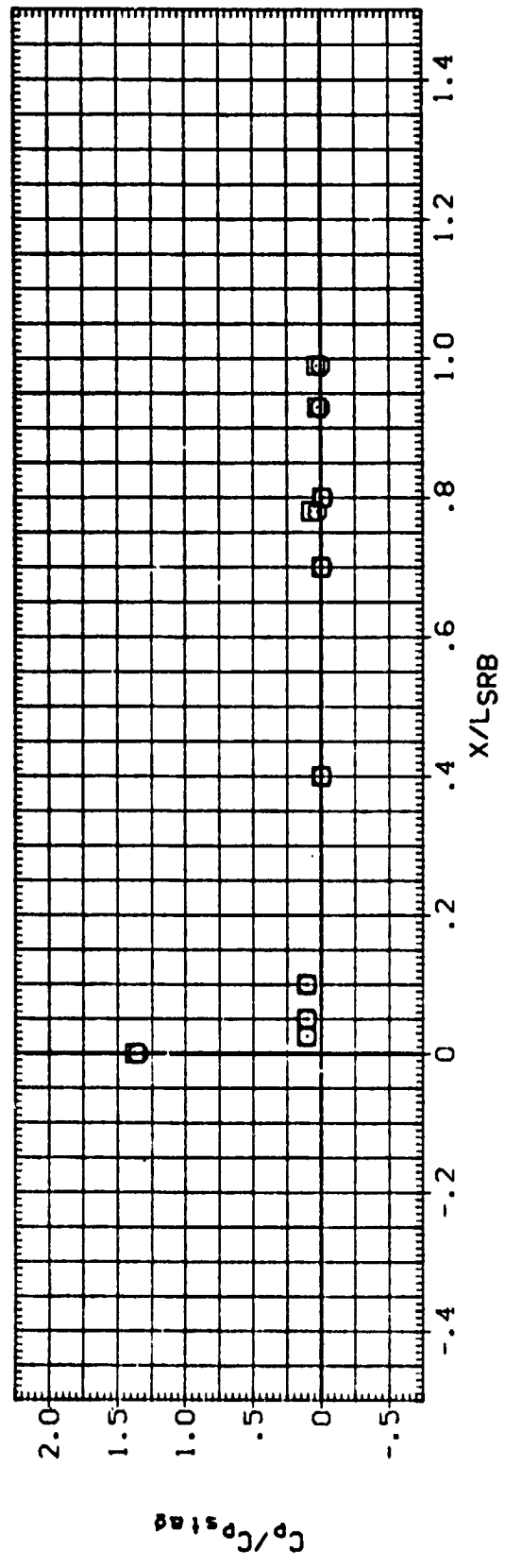


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0
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[RQ3SAC] UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
-5.000 225.000 4.500
.000 210.000

RN/L 5.000 BETA .000

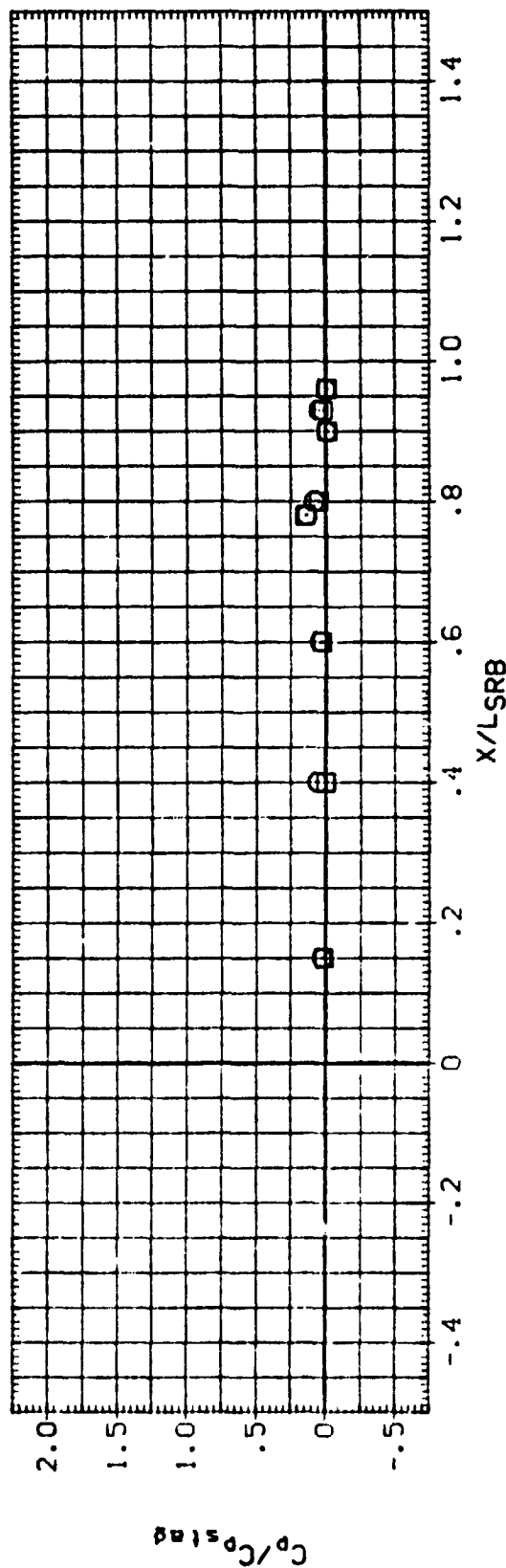
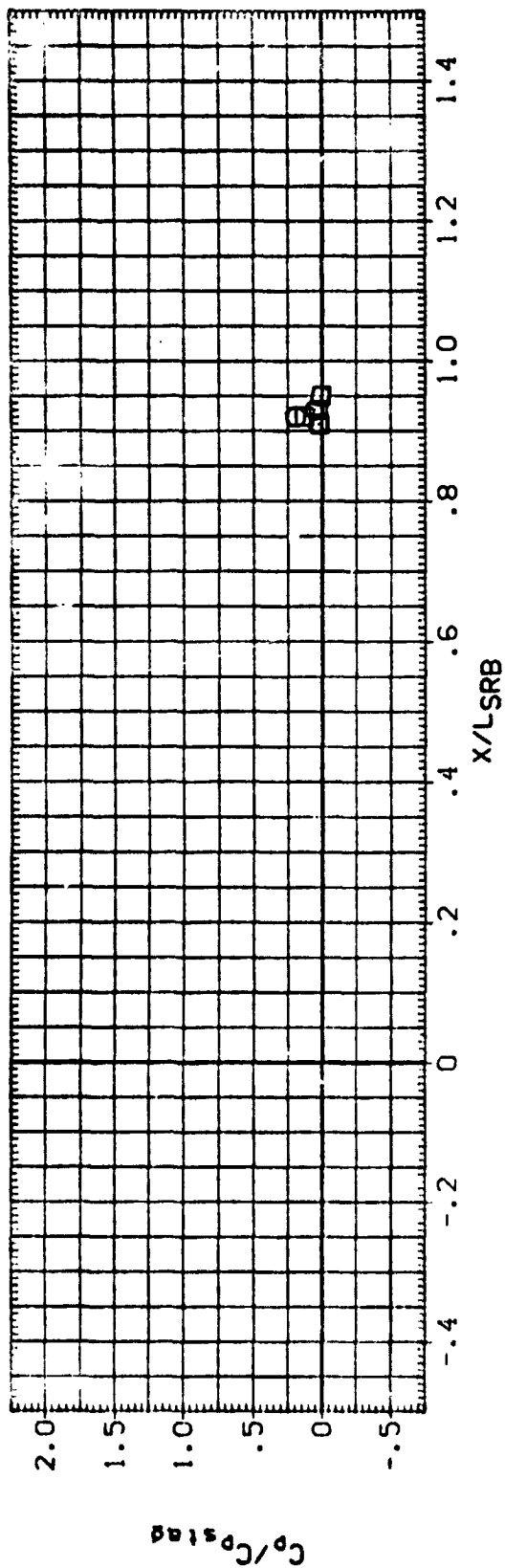


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

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(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -5.000 270.000 4.600
 .000 247.500

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

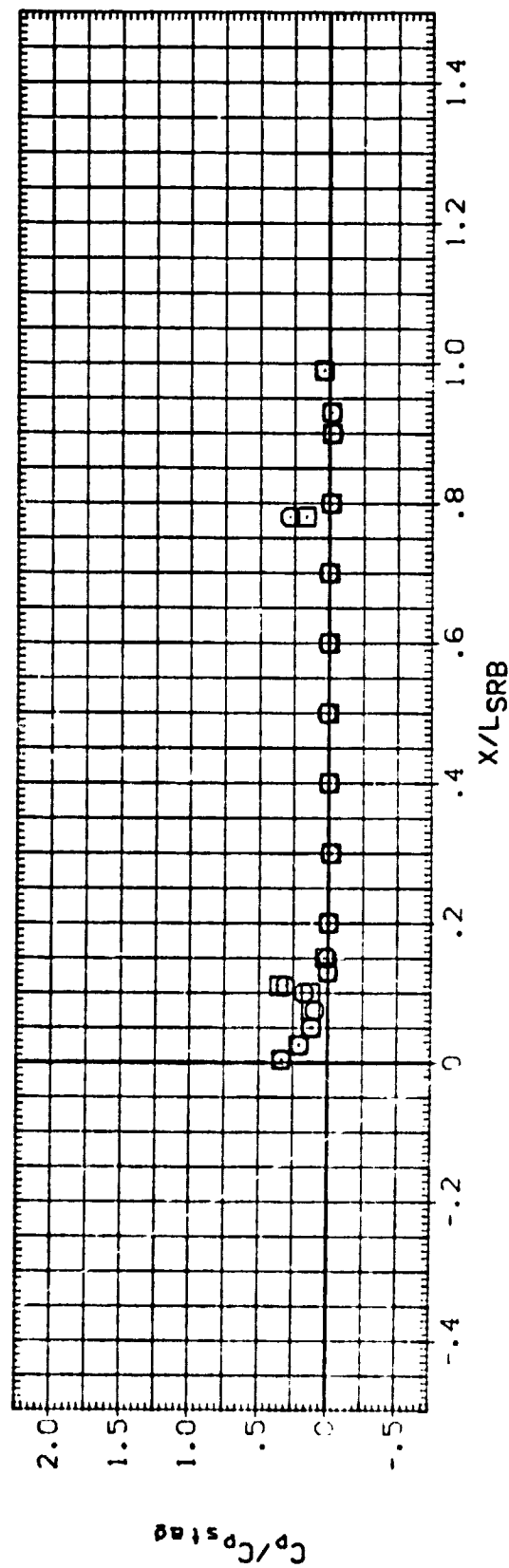
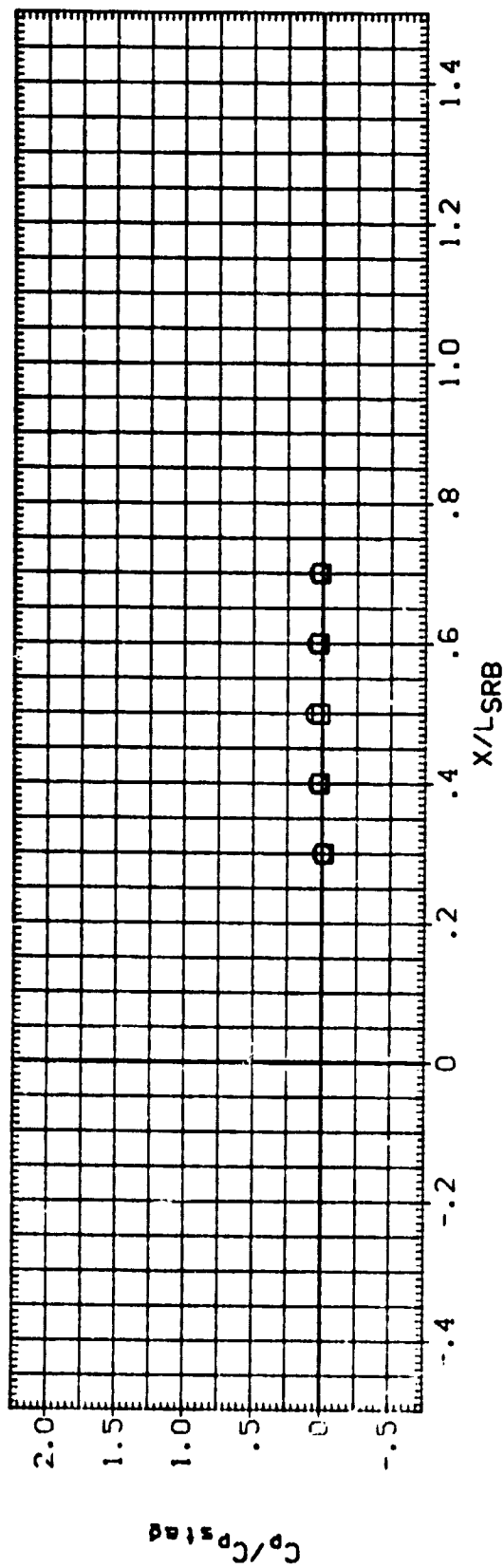


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 □ .003 .600 2.950
 5.000 .400

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

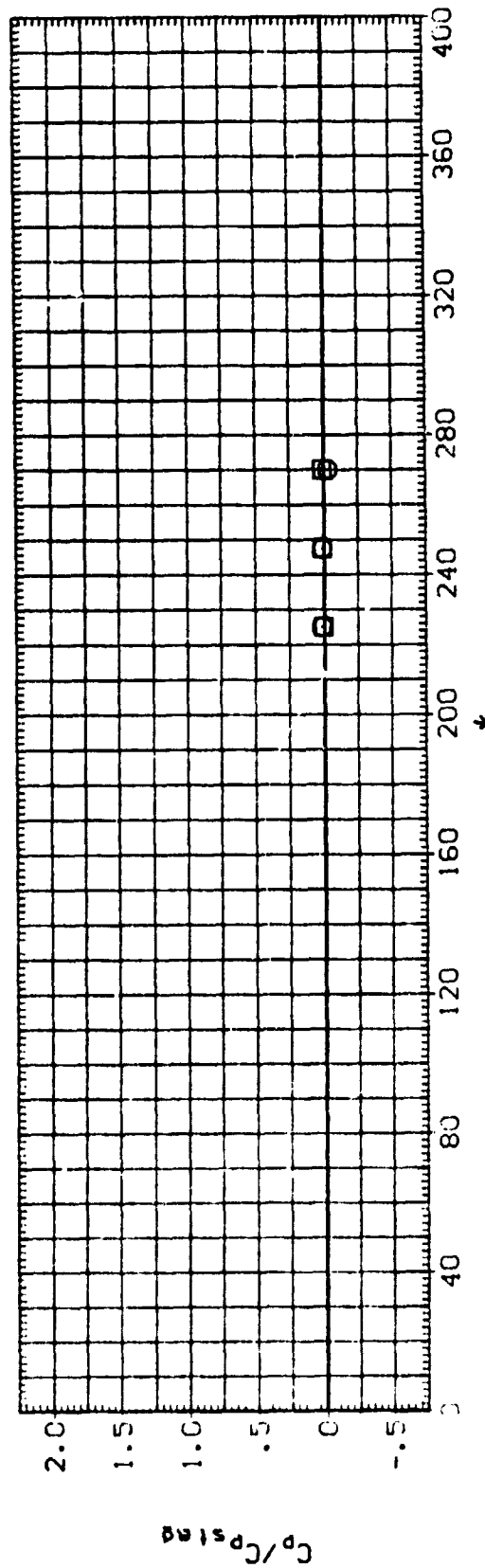
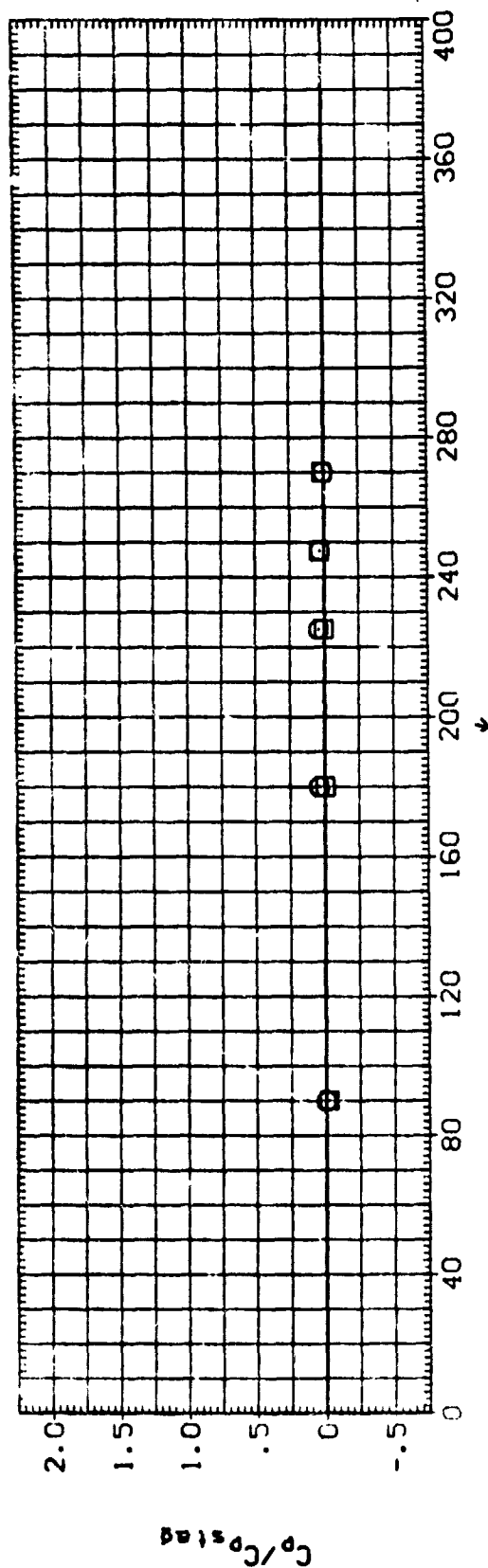


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
□ .000
5.000

X/LSPB MACH
.783 2.950
.700

PARAMETRIC VALUES
RN/L 5.000 BETA .000

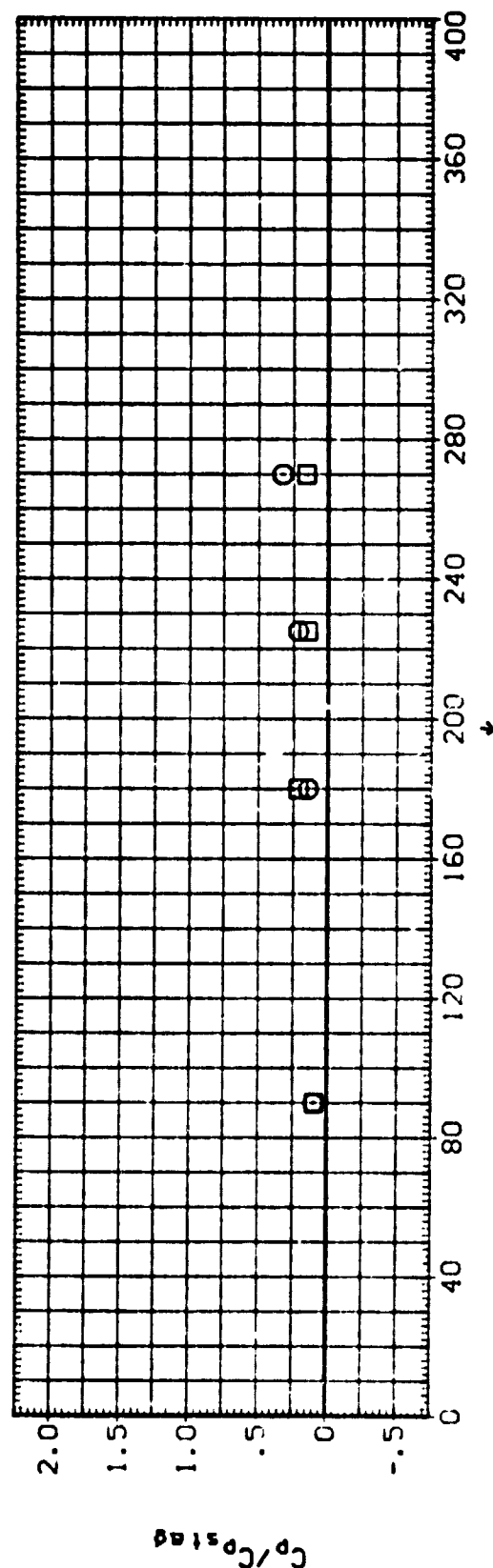
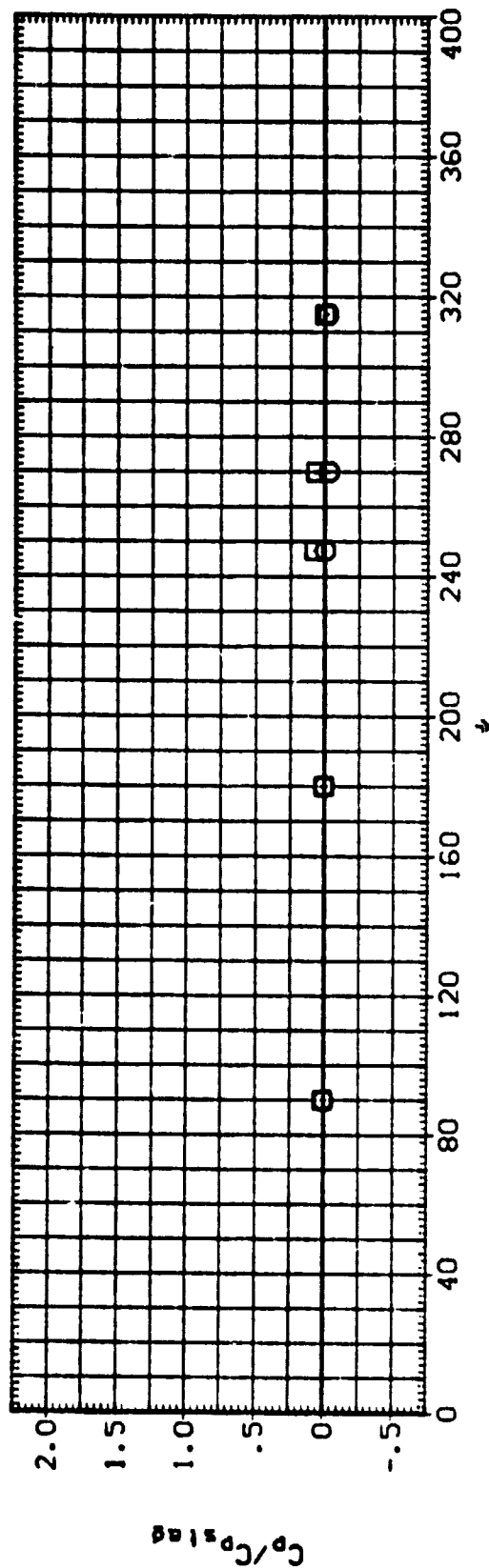


FIG. 27 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

(R03SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 000 5.000 .930 2.950

PARAMETRIC VALUES
 RN/L 5.000 BETA .010

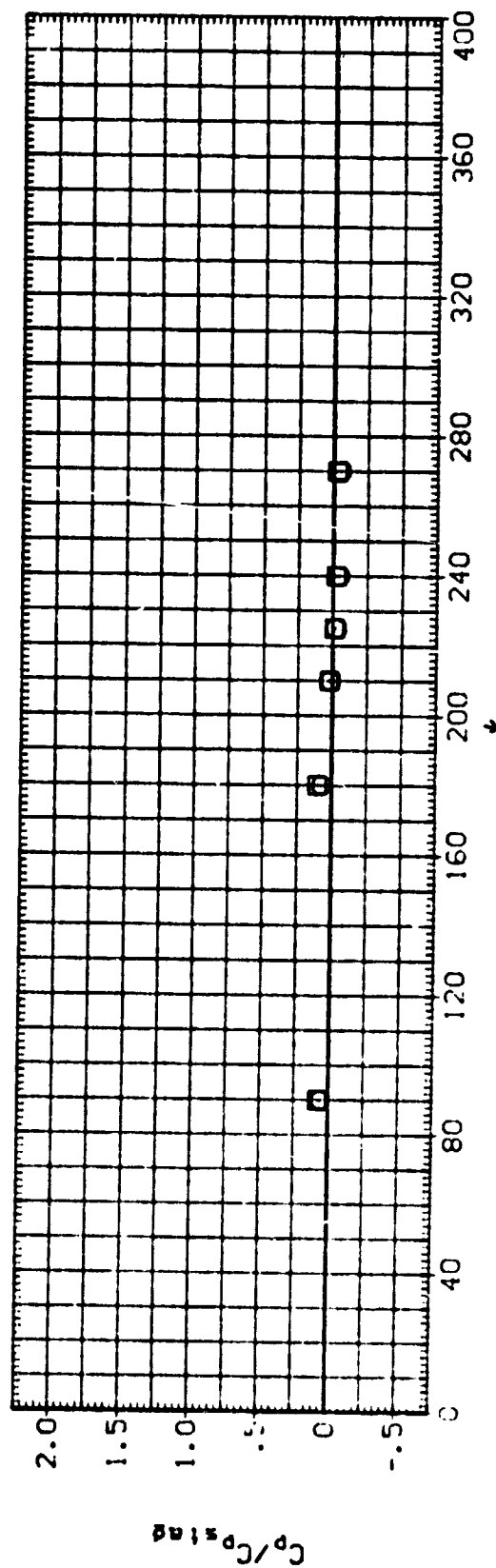
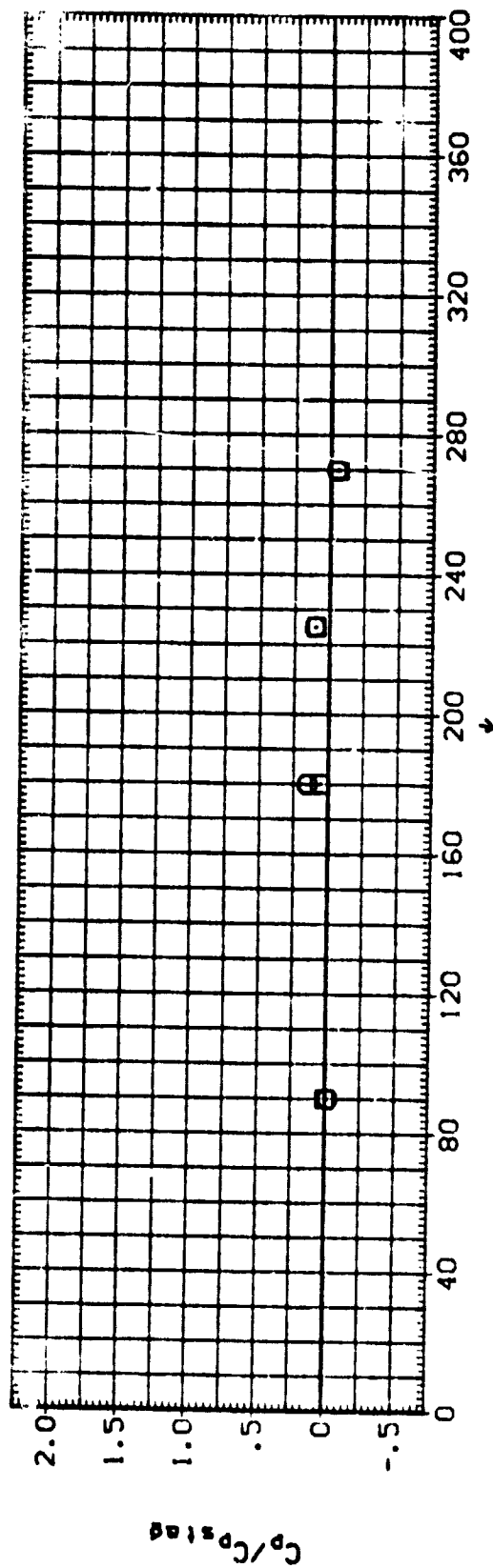


FIG. 27 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0, RN/L= 5.0

[R03SAC] UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	X/LSRB	MACH	RN/L	PARAMETRIC VALUES
□	.000	.990	2.950		5.000 BETA .000
□	5.000	.960			

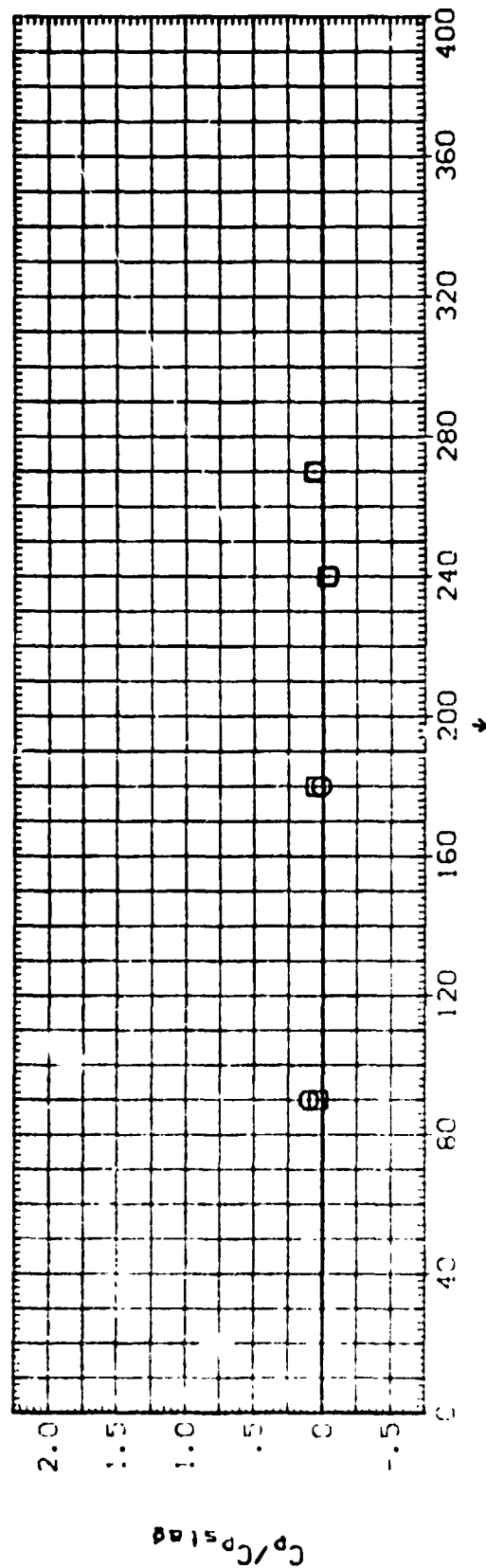
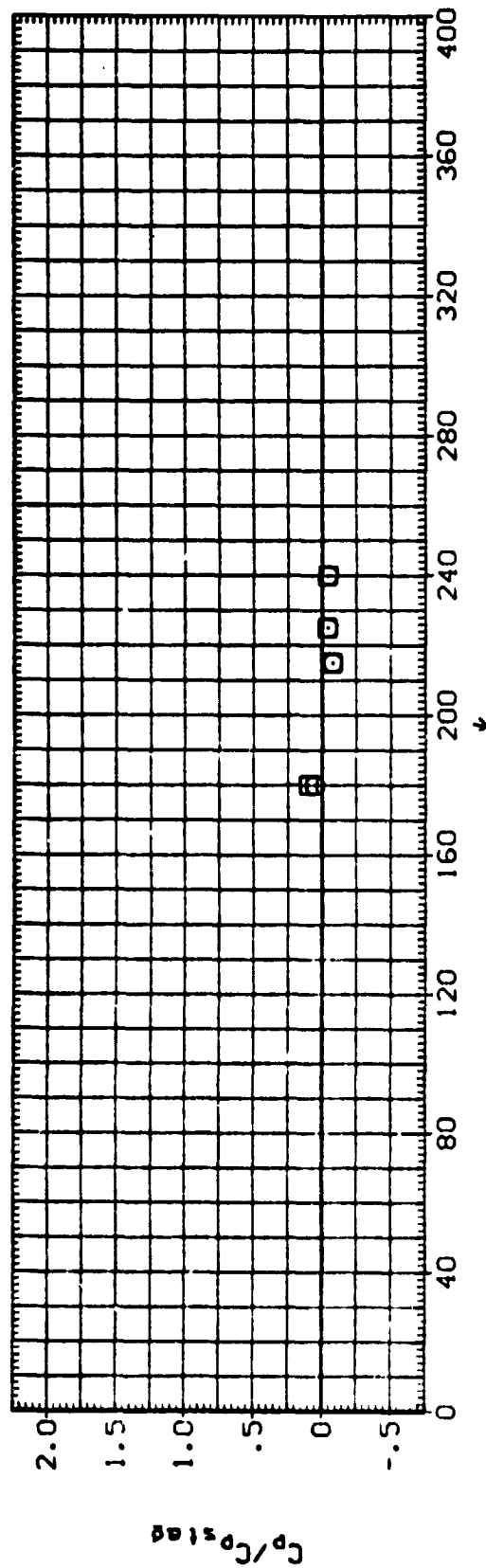
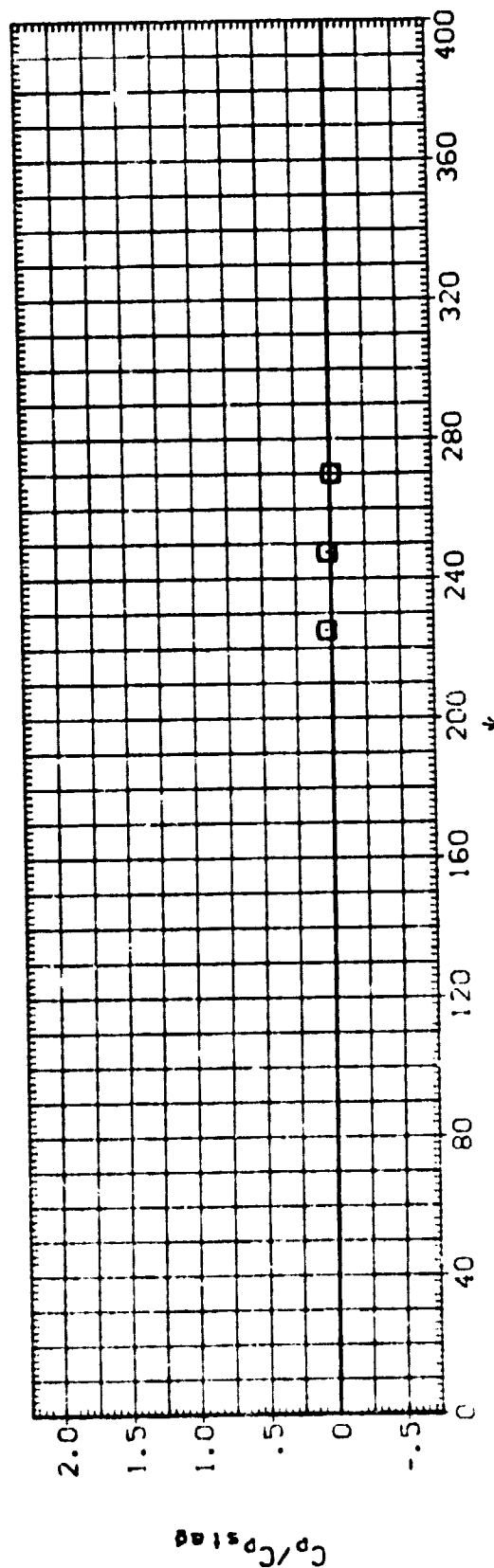
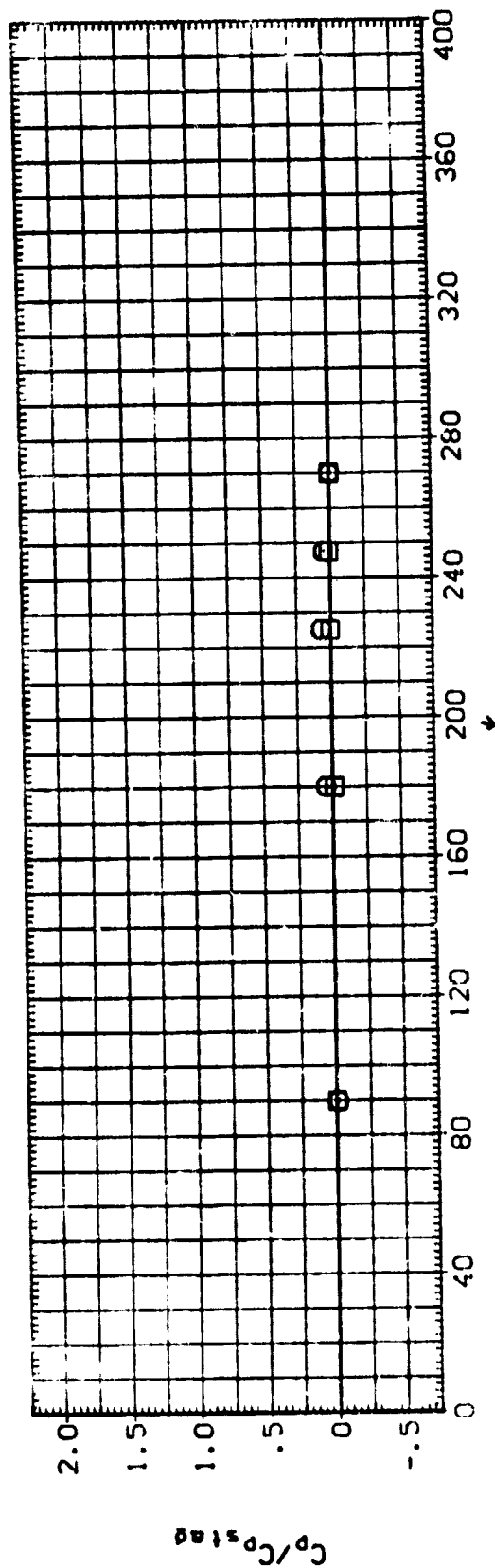


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

(R03SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/L SR8 MACH
-5.000 .600 3.700
0 .400

PARAMETRIC VALUES
RN/L 5.000 BETA .000



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FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET
BOOSTER. BETA= 0. RN/L= 5.0

(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/L SRB MACH
 -5.00 .780 3.700

PARAMETRIC VALUES
 5.000 BETA .000

RN/L

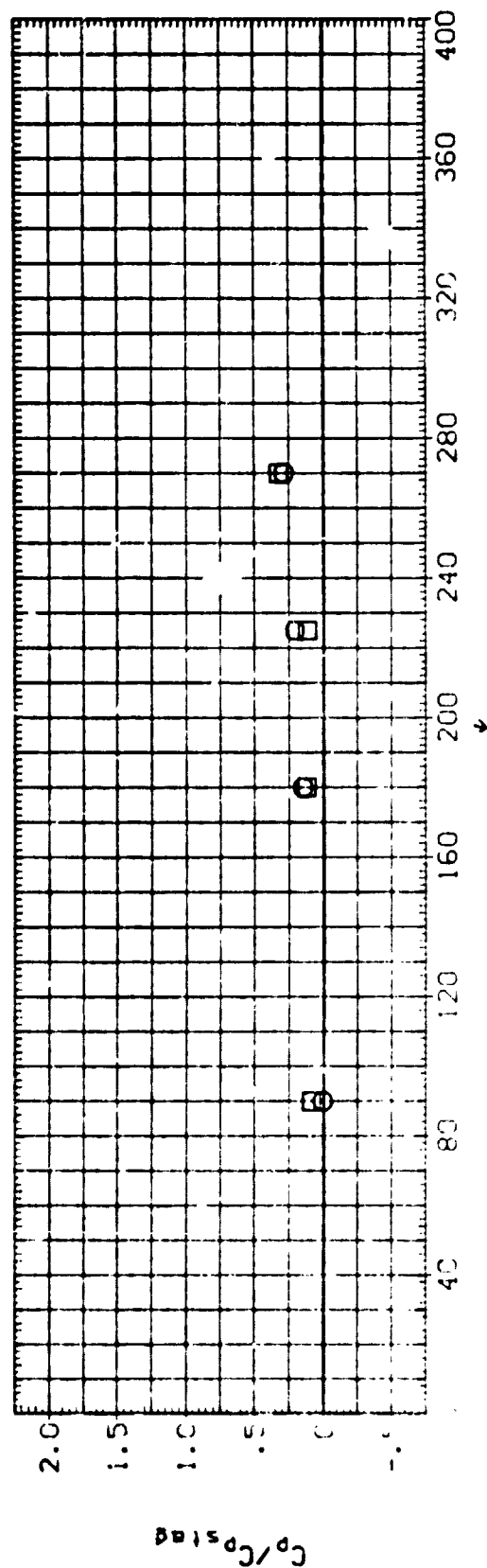
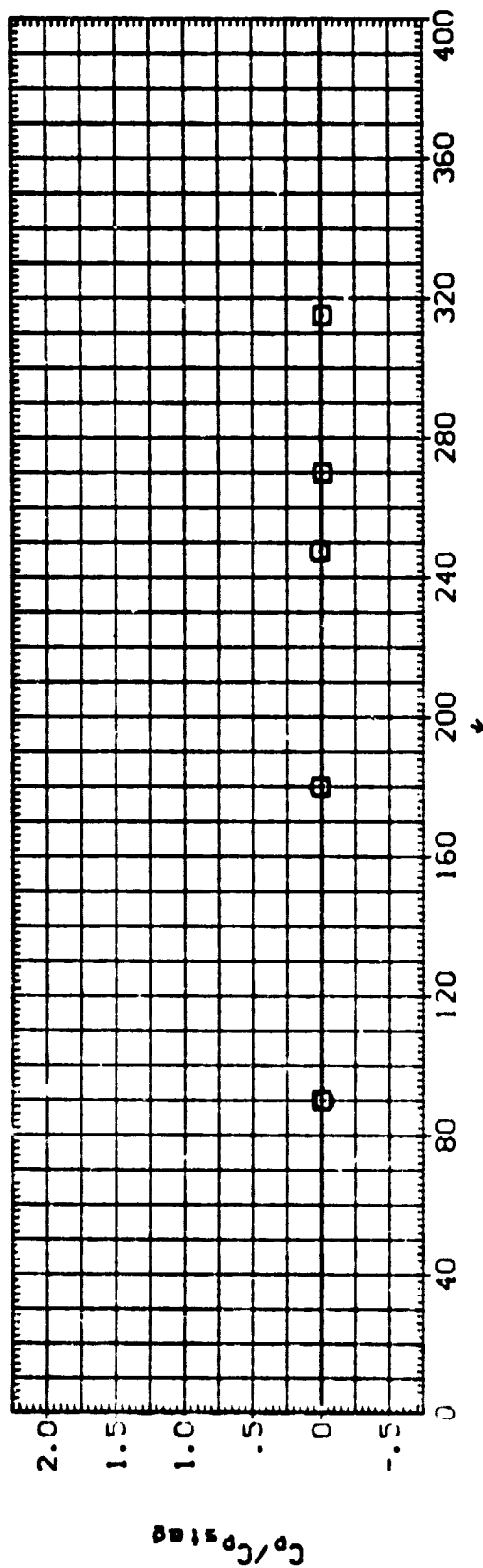


FIG. 27 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKE
 BOOSTER. BETA= 0. RN/L= 5.0

(RQ3SAC) UPWT 1059 (IH4) 0i-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL
ALPHA
-5.000
.000

X/LSK8
MACH
3.700
.800

PARAMETRIC VALUES
RN/L
5.000
BETA
.000

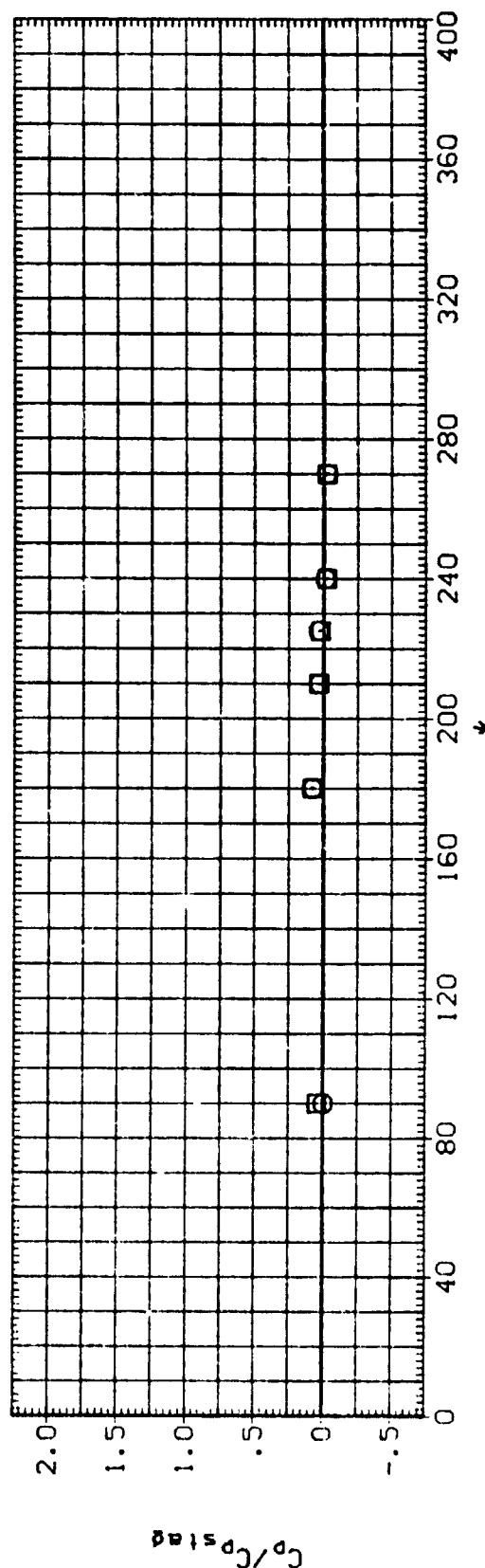
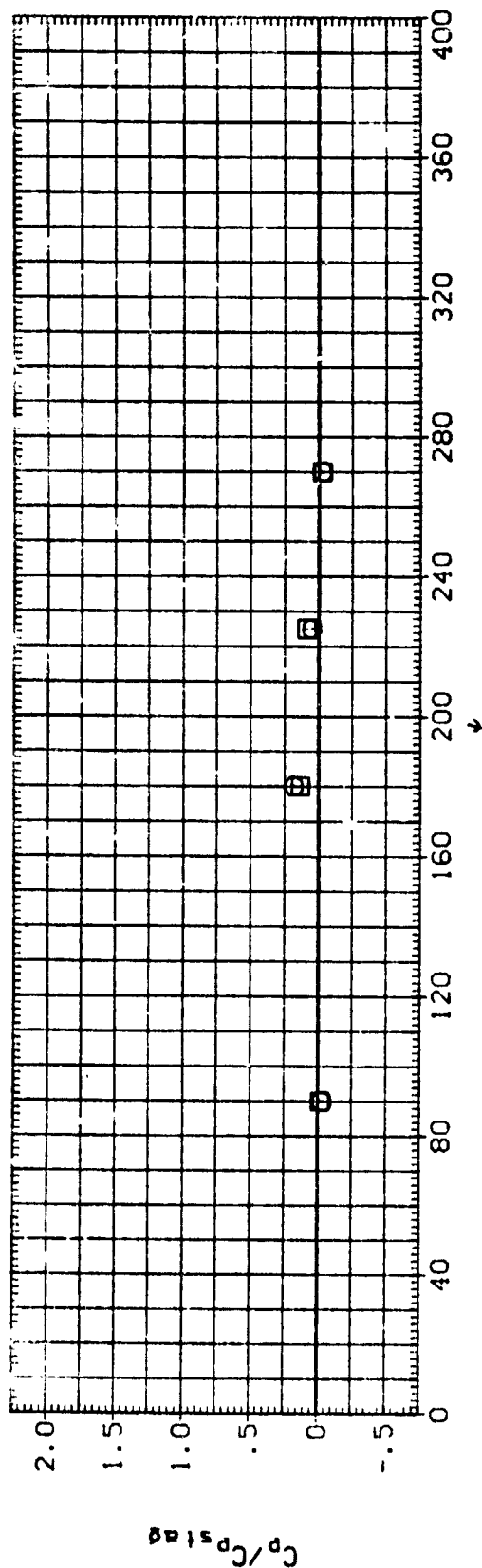


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
B -3.000
- .000

X/LSRB MACH
- .990 3.700
- .960

PARAMETRIC VALUES
RN/L 5.000 BETA .000

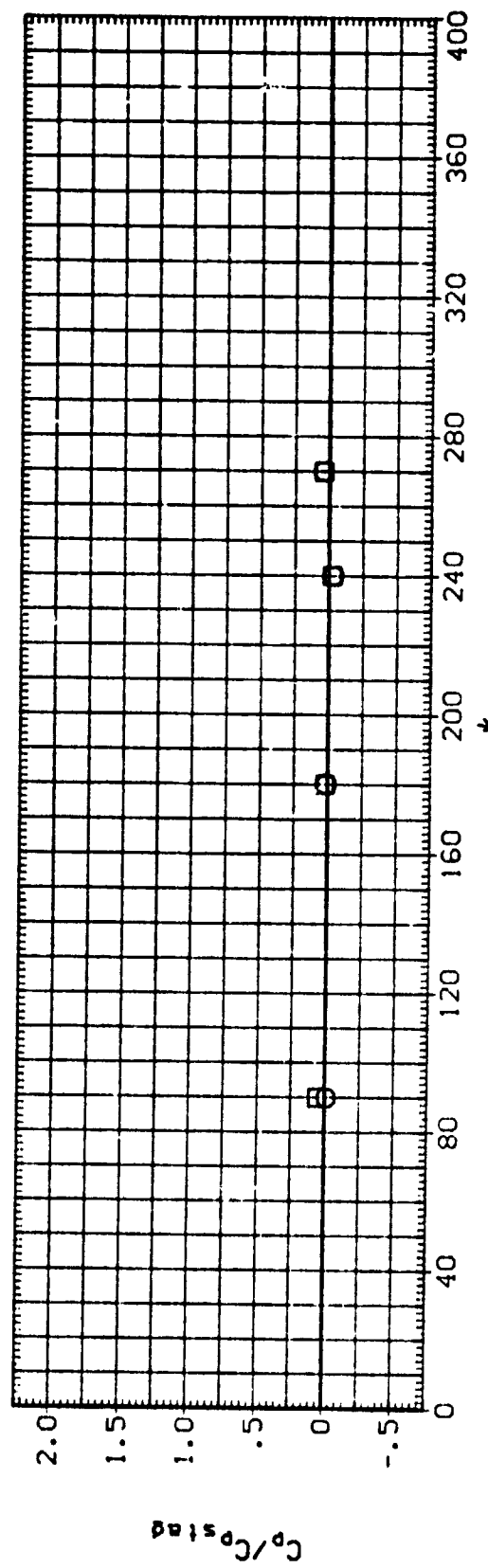
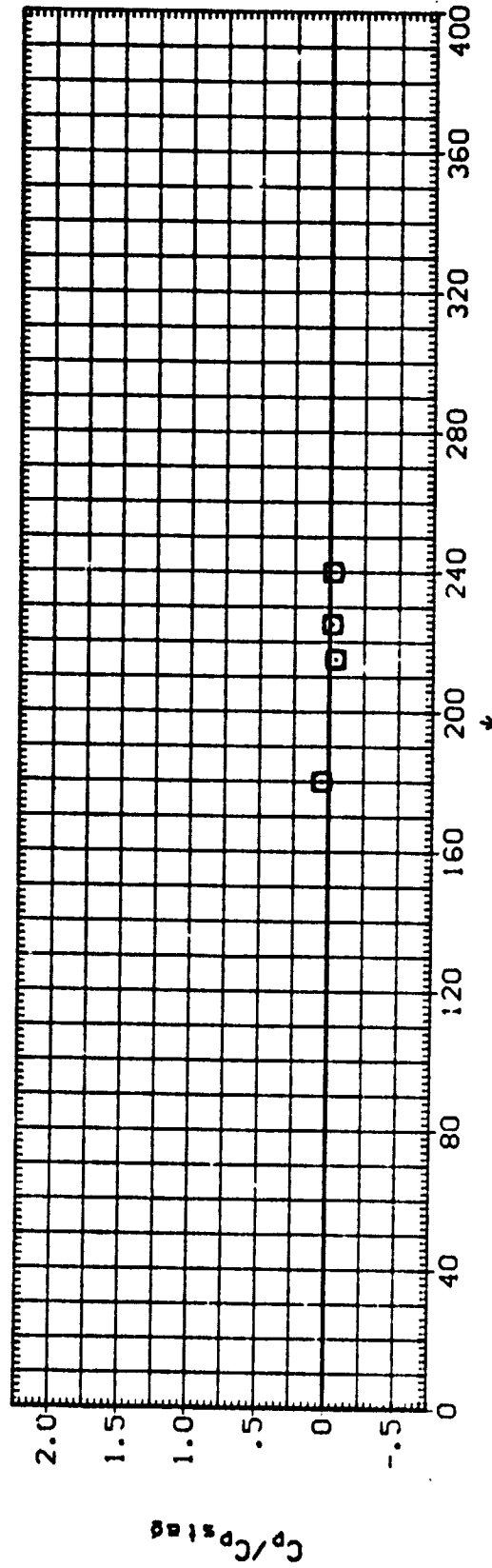


FIG. 27 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

(R03SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
-5.000
.000

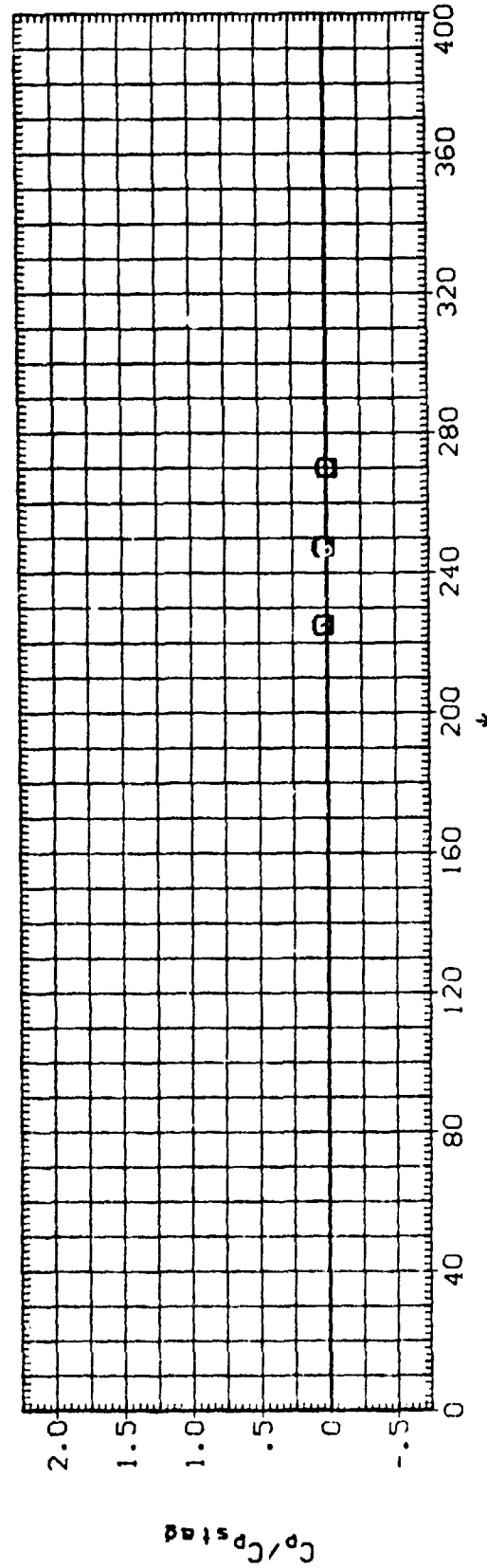
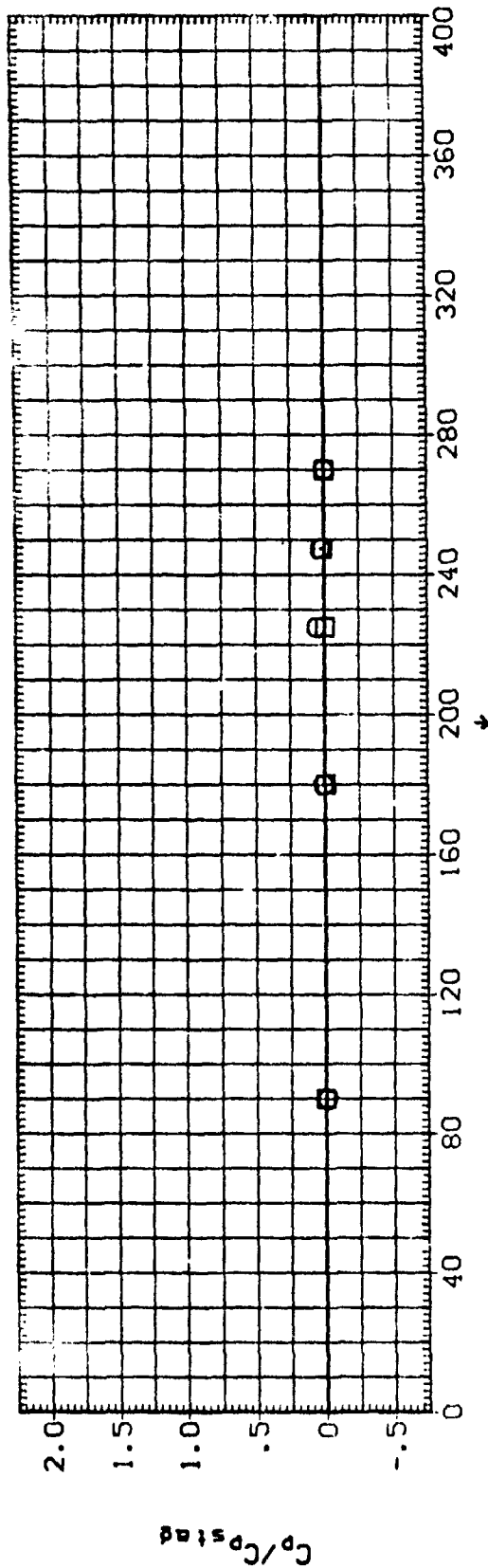
X/L SR8
.600
.400

MACH
4.600

RN/L

PARAMETRIC VALUES
5.000 BETA

.000



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FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET
BOOSTER, BETA= 0, RN/L= 5.0

(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	X/LSFB	MACH	RN/L	PARAMETRIC VALUES
8	-5.000	.780	4.600		5.000 BETA .000
	.000	.700			

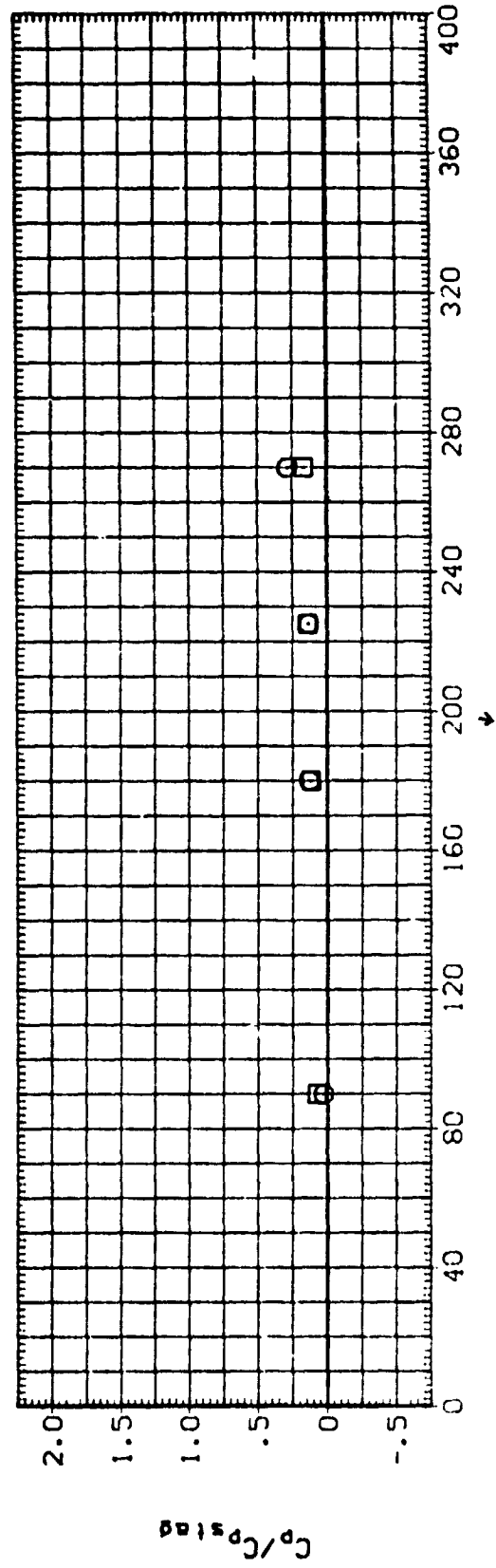
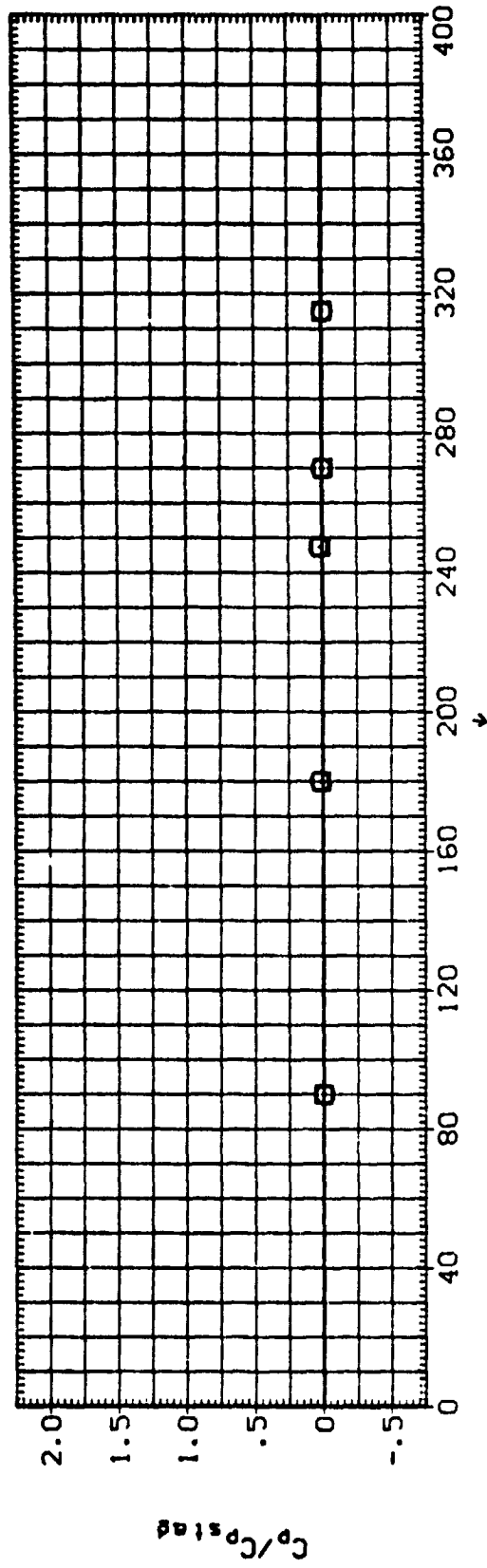


FIG. 27 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

(RQ3SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 -5.000 .930 4.600
 .000 .800

PARAMETRIC VALUES
 RN/L 5.000 DELTA .000

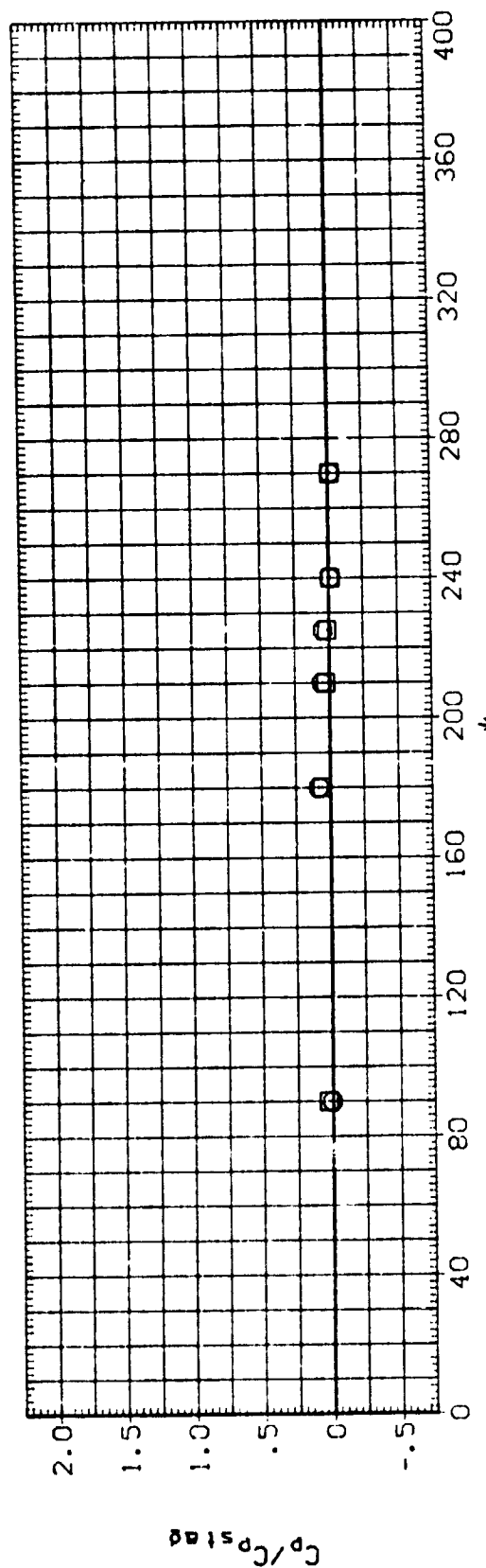
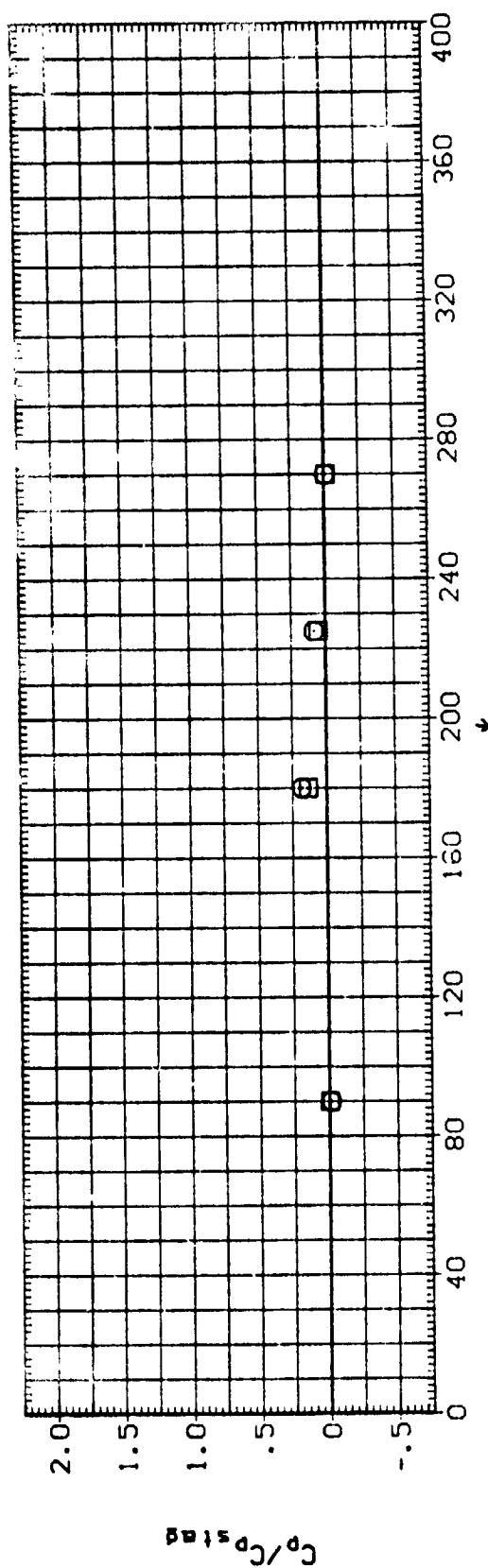


FIG. 27 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, $BETA = 0$, $RN/L = 5.0$

(R03SAC) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSR8 MACH
 .5.000 .990 4.600
 .000 .960

PARAMETRIC VALUES
 RN/L 5.000 BETA .000

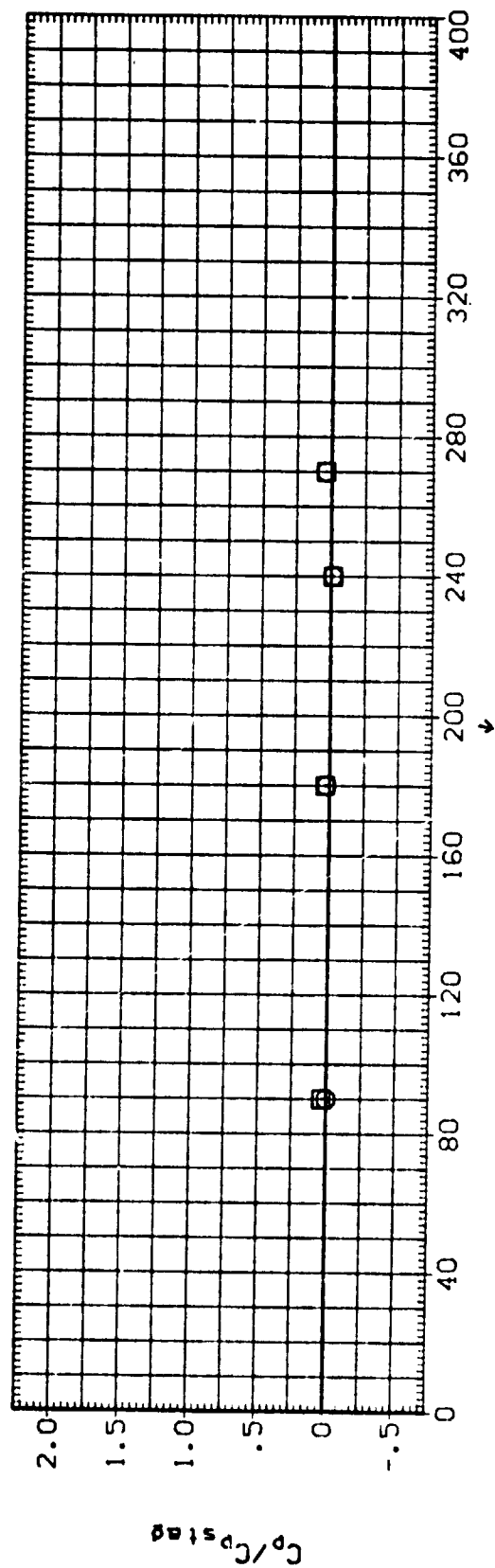
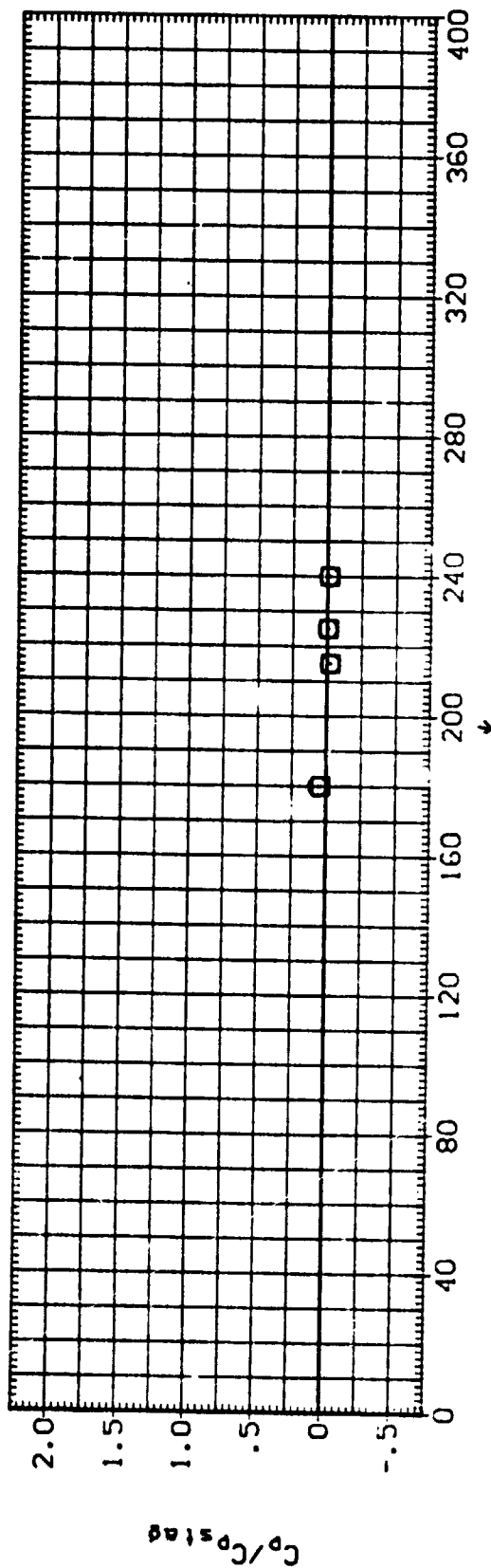


FIG. 27 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER. BETA= 0. RN/L= 5.0

(R03BAE) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES	BETA
□	-5.000	95.000	3.700		3.000	5.000
□	.000					

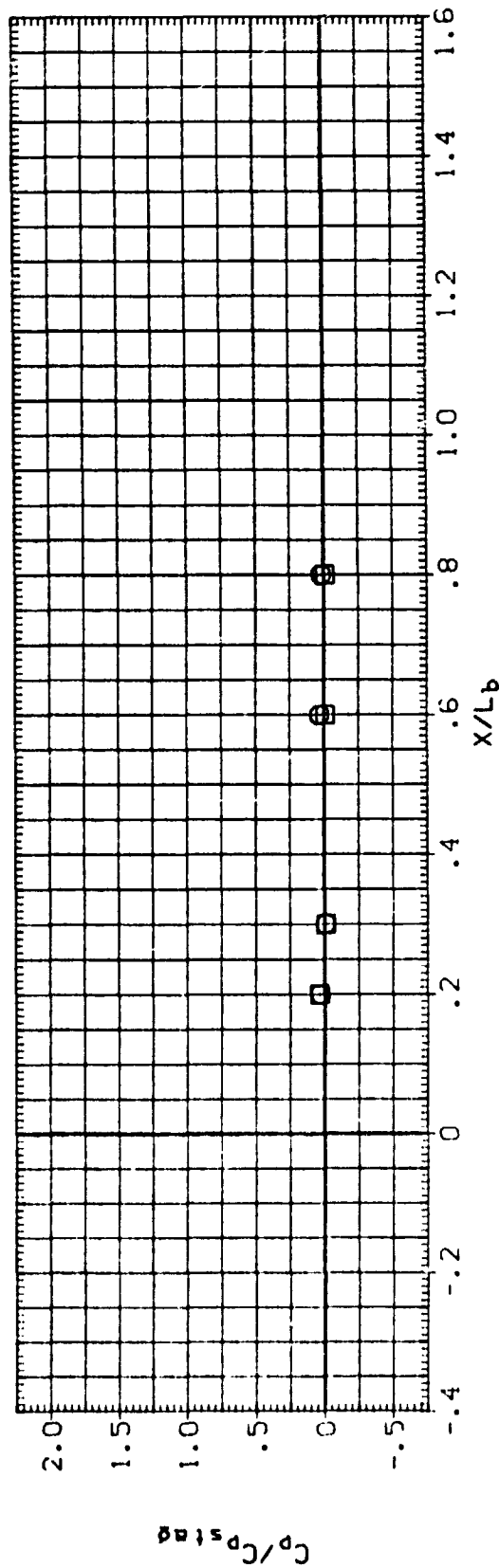
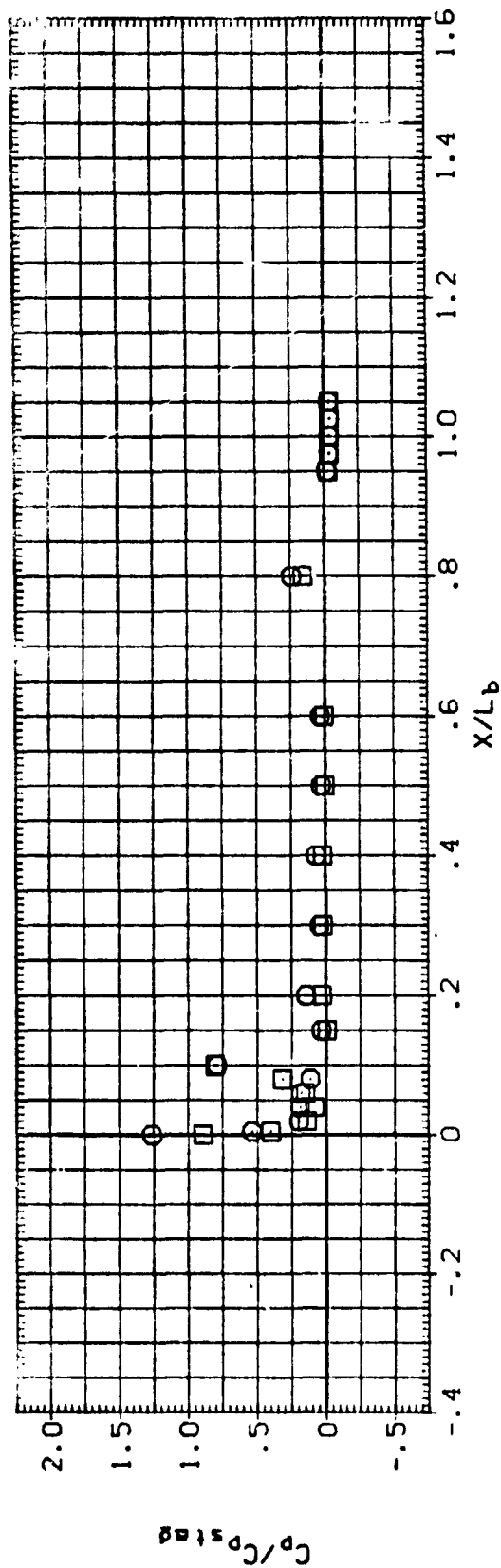


FIG. 28 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 5. RN/L= 3.0

(R03BAE) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL: \square ALPHA: -5.000 PHI: 180.000 MACH: 3.700

PARAMETRIC VALUES
RN/L: 3.000 BETA: 5.000

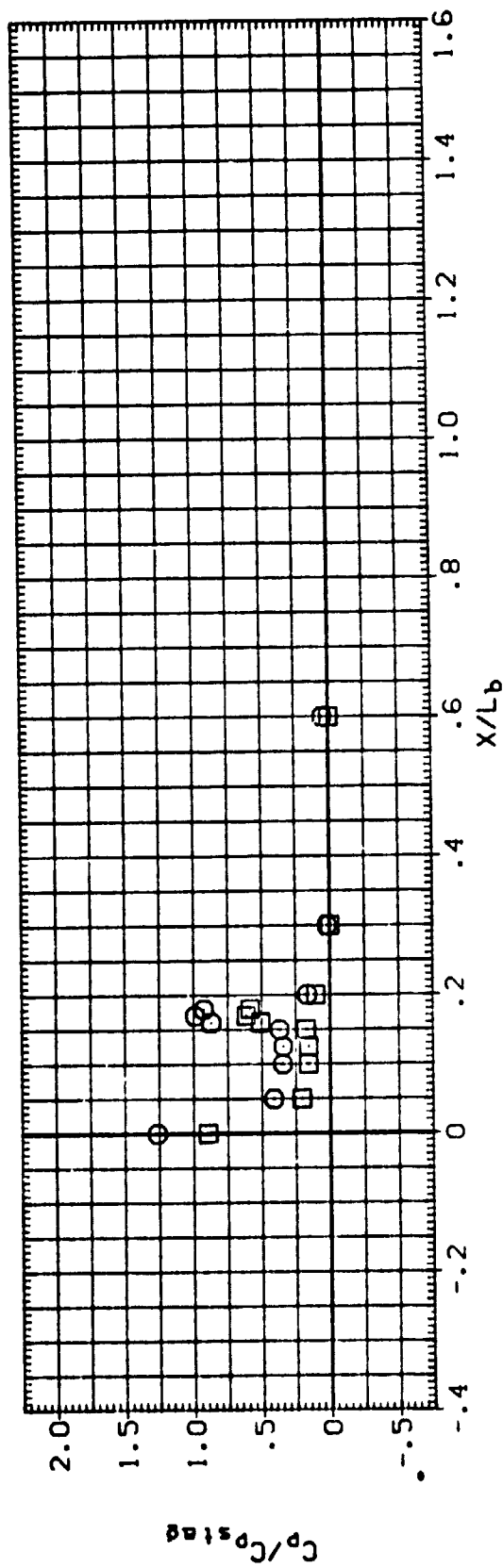
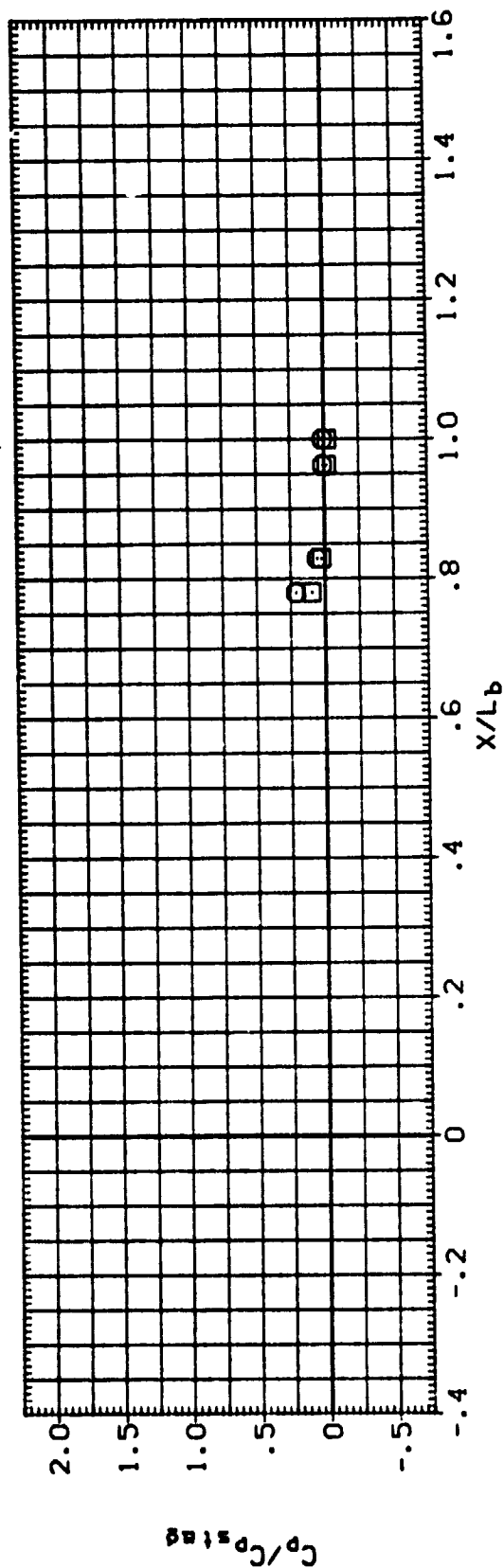


FIG. 28 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, ORBITER FUSELAGE, BETA= 5, RN/L= 3.0

(R038AE) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL 

ALPHA
-5.000
.000

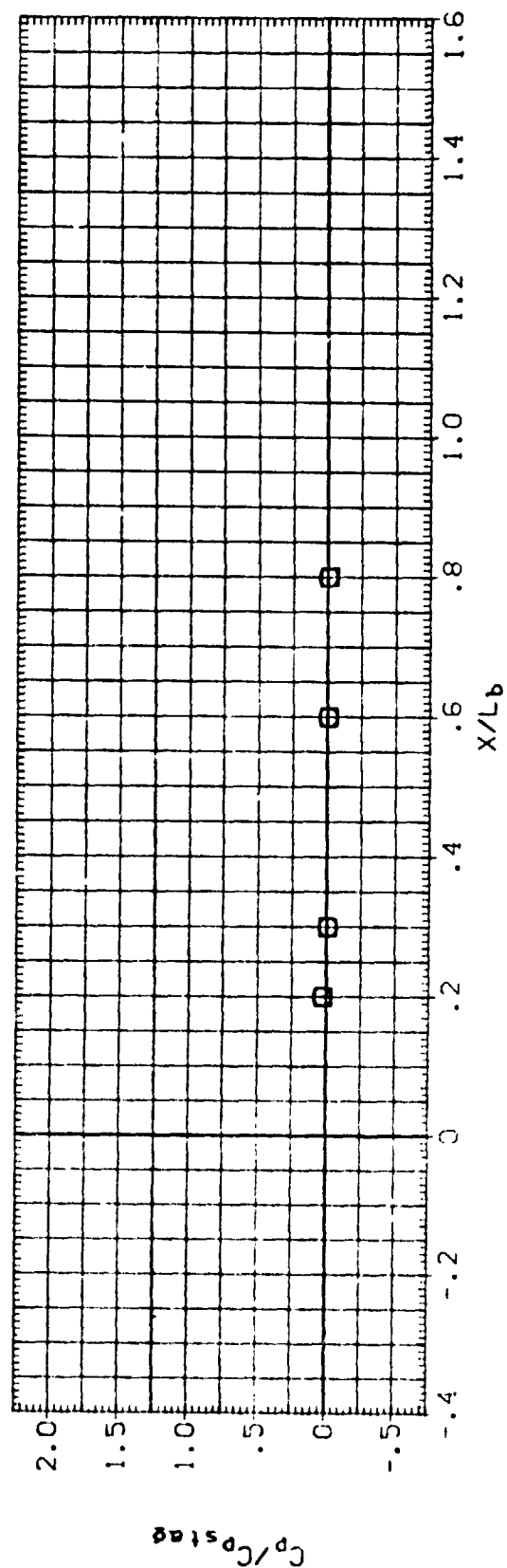
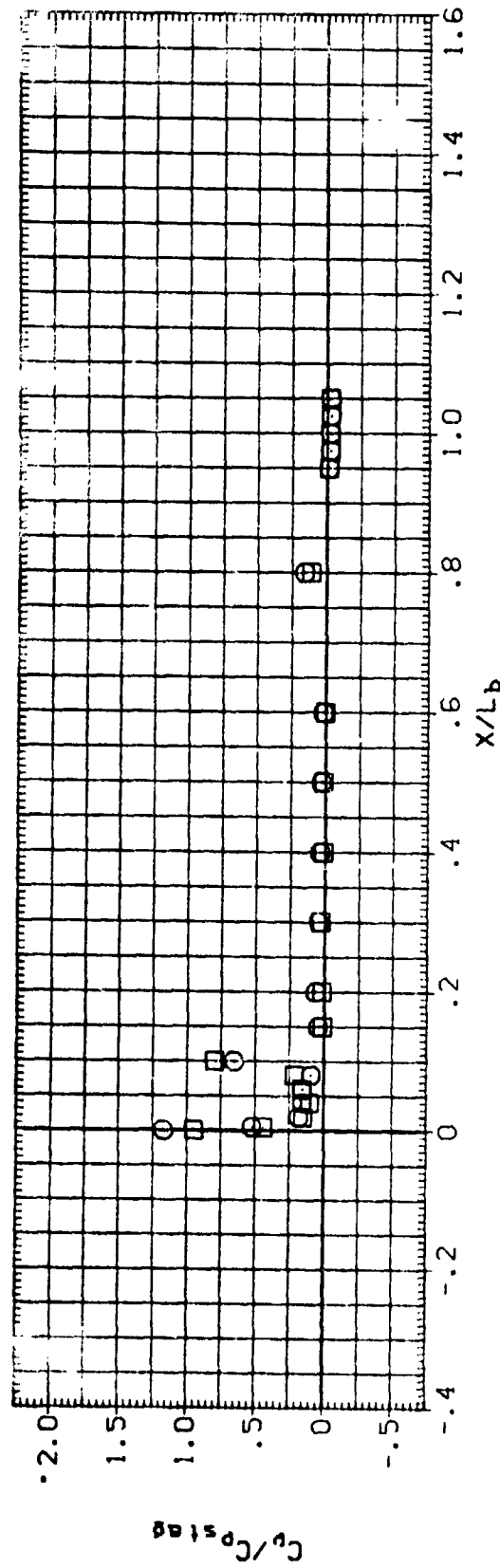
PHI
95.000
.000

MACH
4.600

RN/L

PARAMETRIC VALUES
3.000 BETA

5 000



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FIG. 28 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 5. RN/L= 3.0

(RQ3BAE) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALP: A PH: MACH
 -5.000 180.000 4.500
 .000 122.700

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

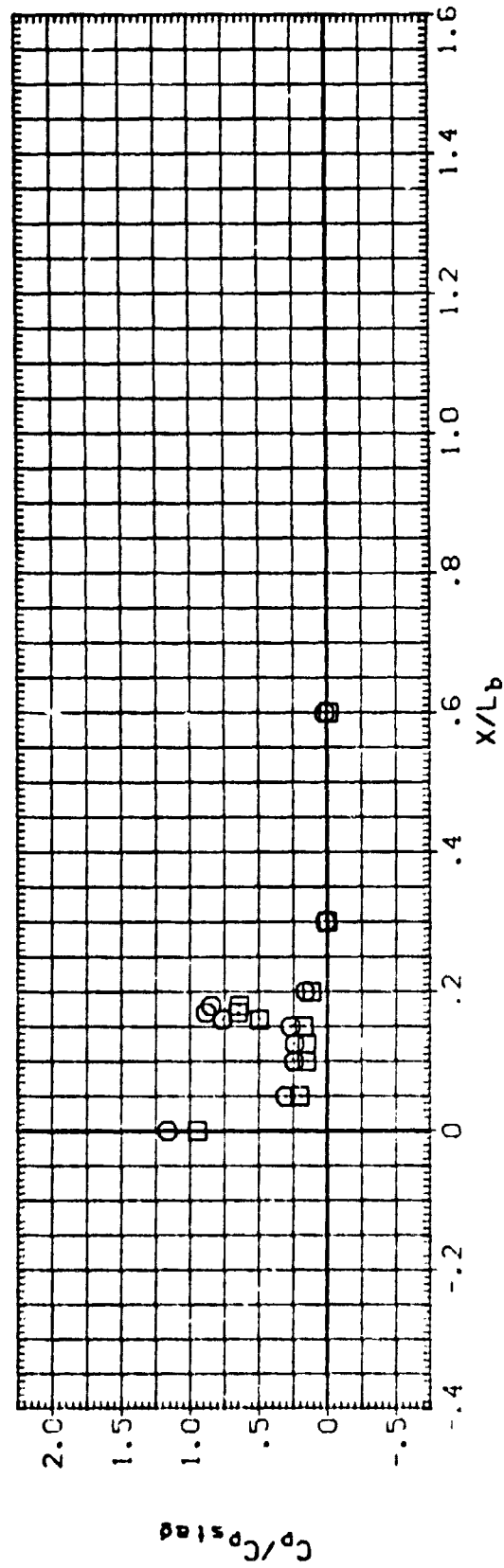
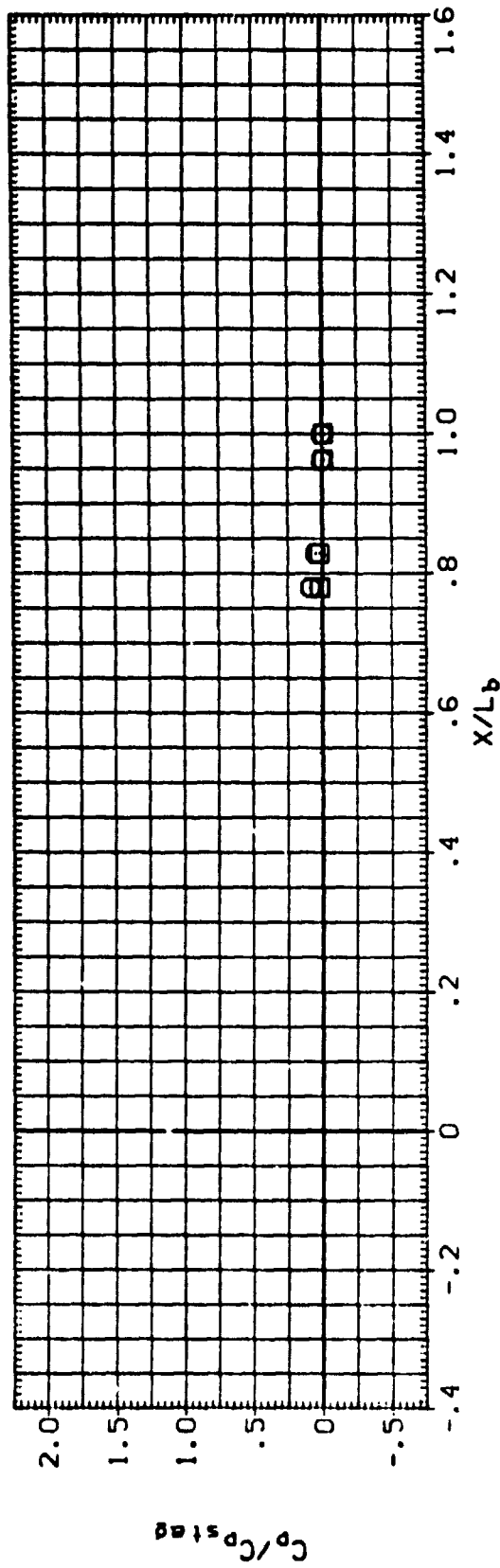


FIG. 28 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 5, RN/L= 3.0

(R03BAE) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA X/LB MACH
 -5.000 .200 3.700
 .000 .100

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

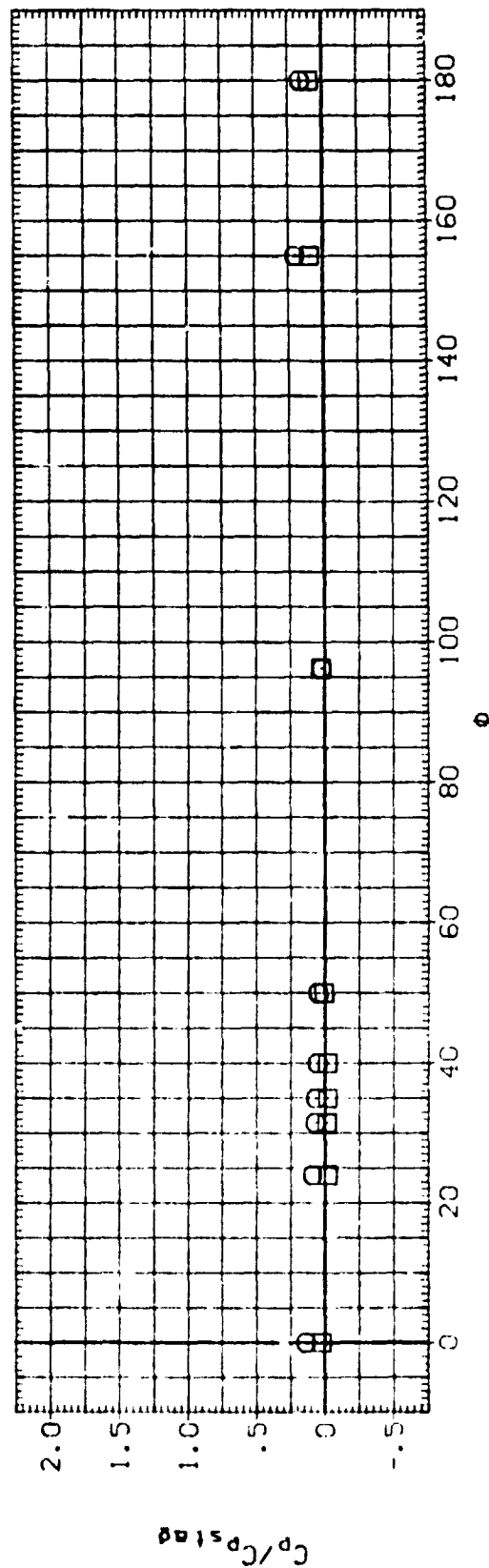
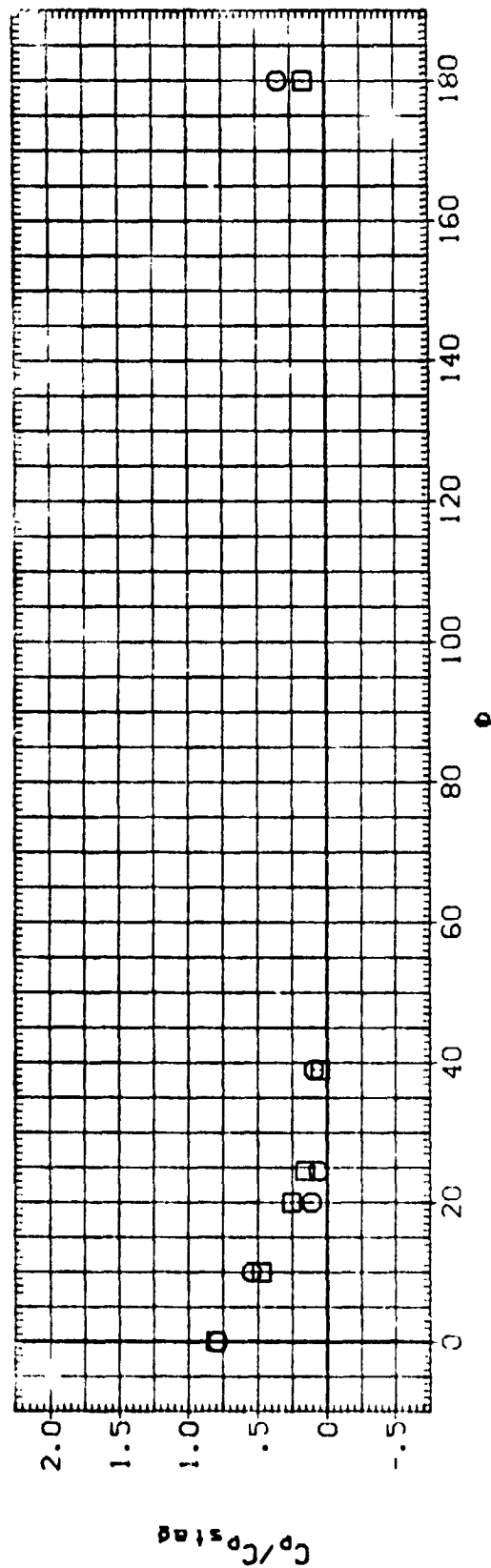


FIG. 28 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 5. RN/L= 3.0

(RQ38AE) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA

-5.000

X/LB

.600

.300

MACH

3.700

RN/L

3.000

PARAMETRIC VALUES

BETA 5.000

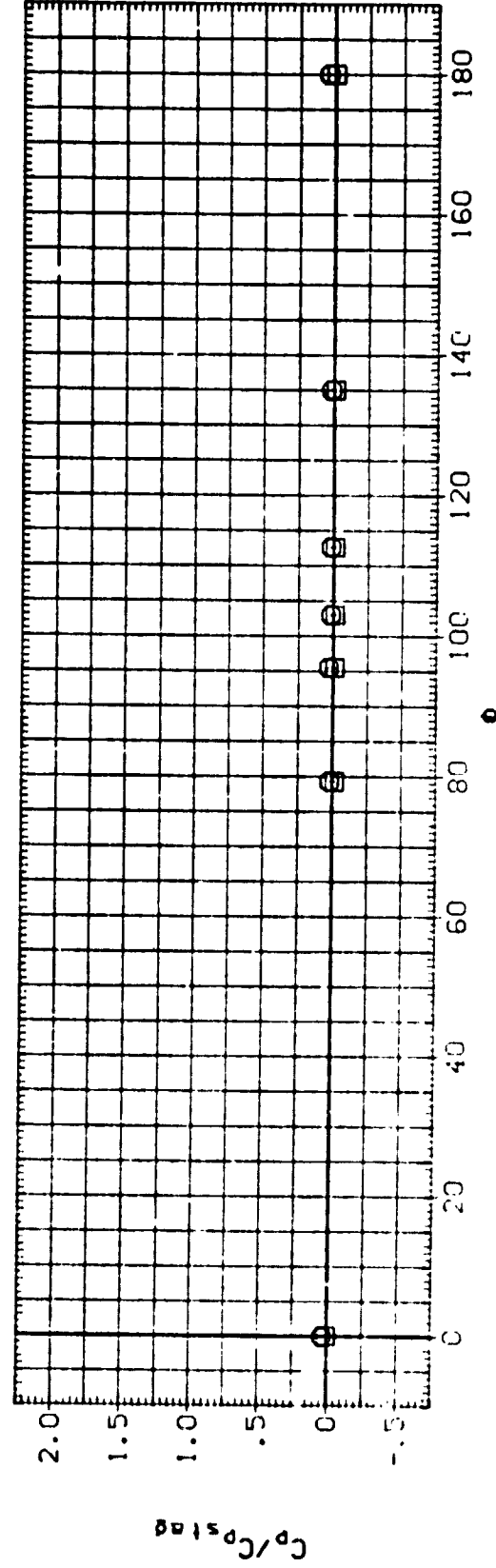
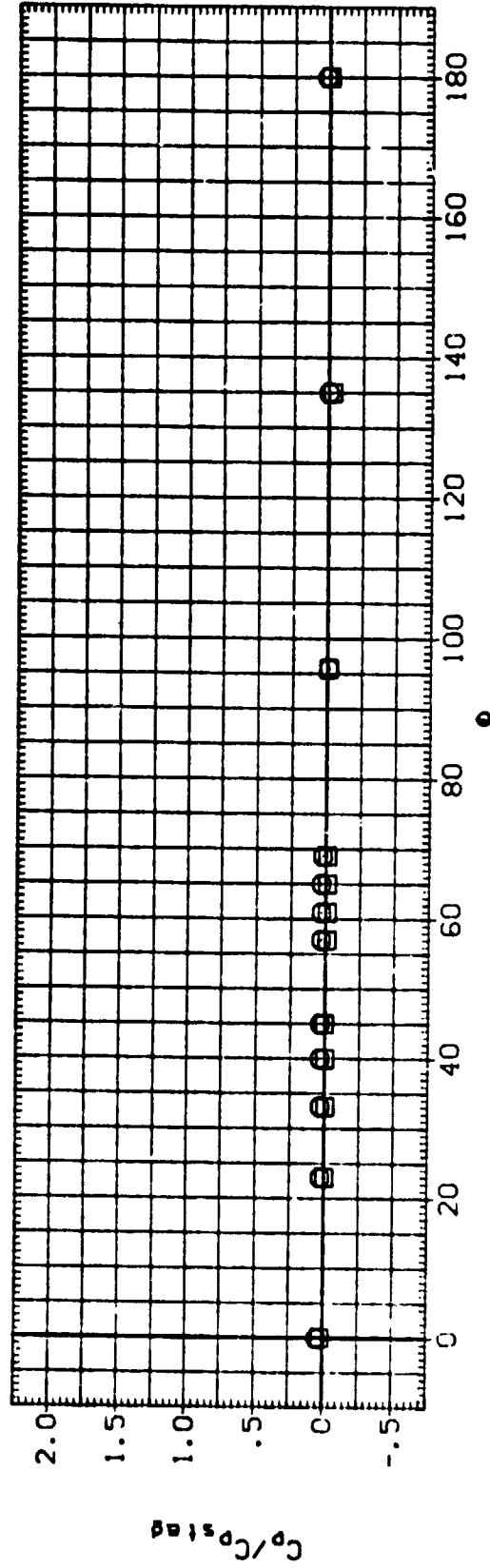


FIG. 28 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 5. RN/L= 3.0

(R03BAE) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

SYMBOL ALPHA X/LB MACH
 -5.000 .200 4.500
 .000 .100

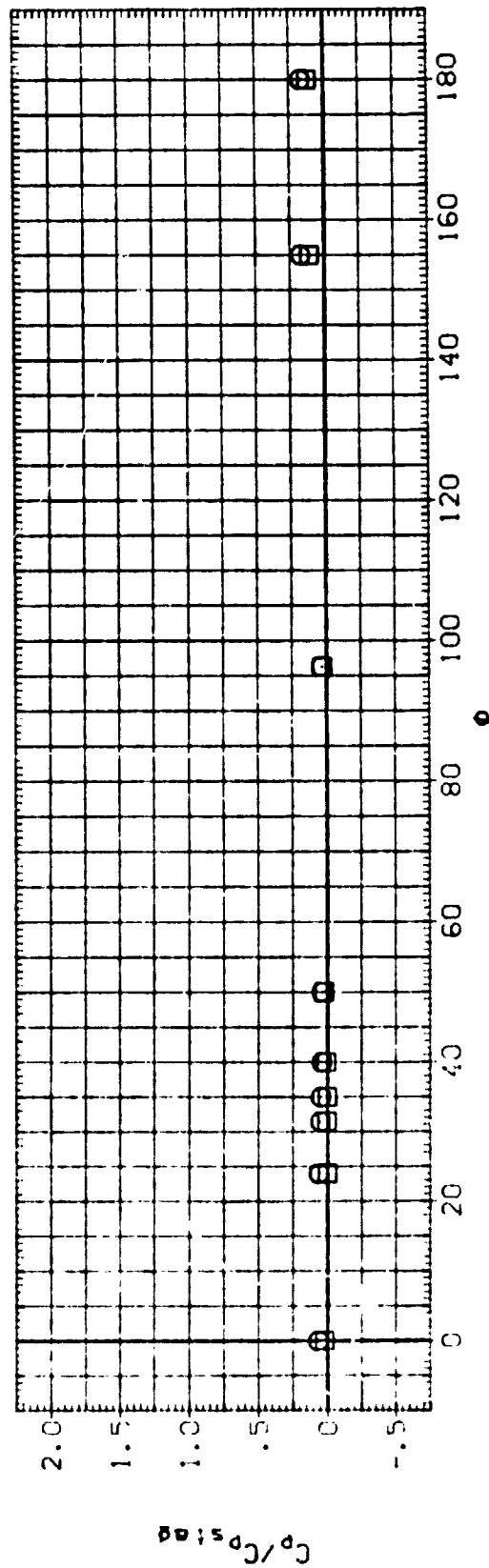
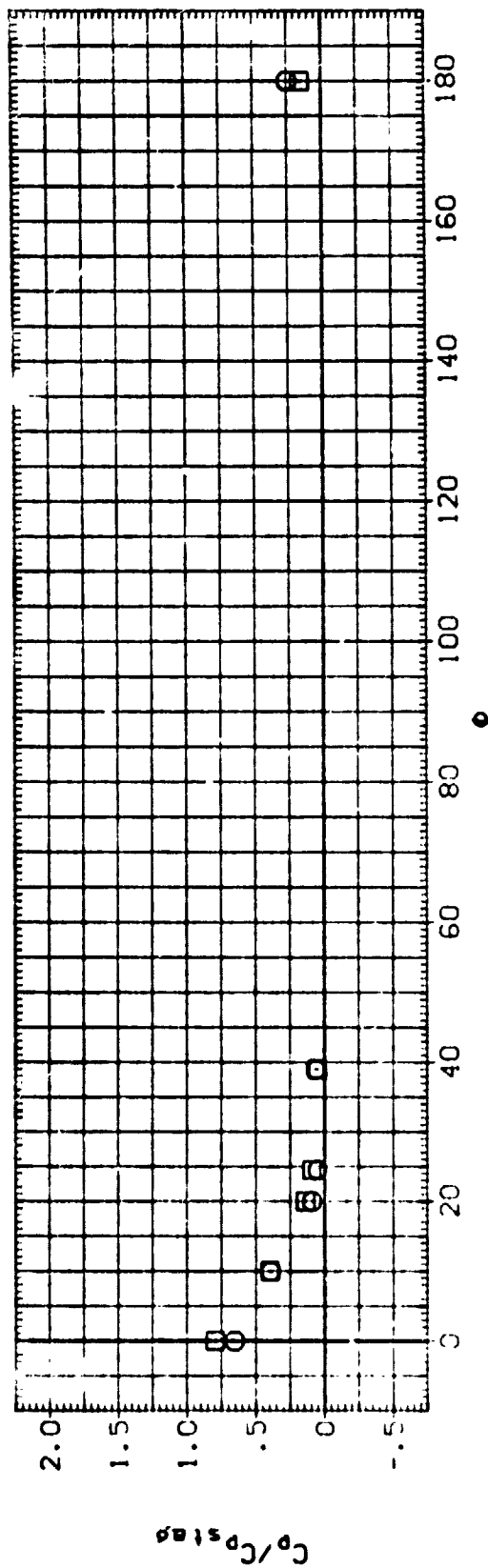


FIG. 28 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 5. RN/L= 3.0

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(R038AE) UPWT 1059 (IH4) 01-T15-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA X/L B MACH
 □ -5.000 .600 4.600
 ○ .000 .300

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

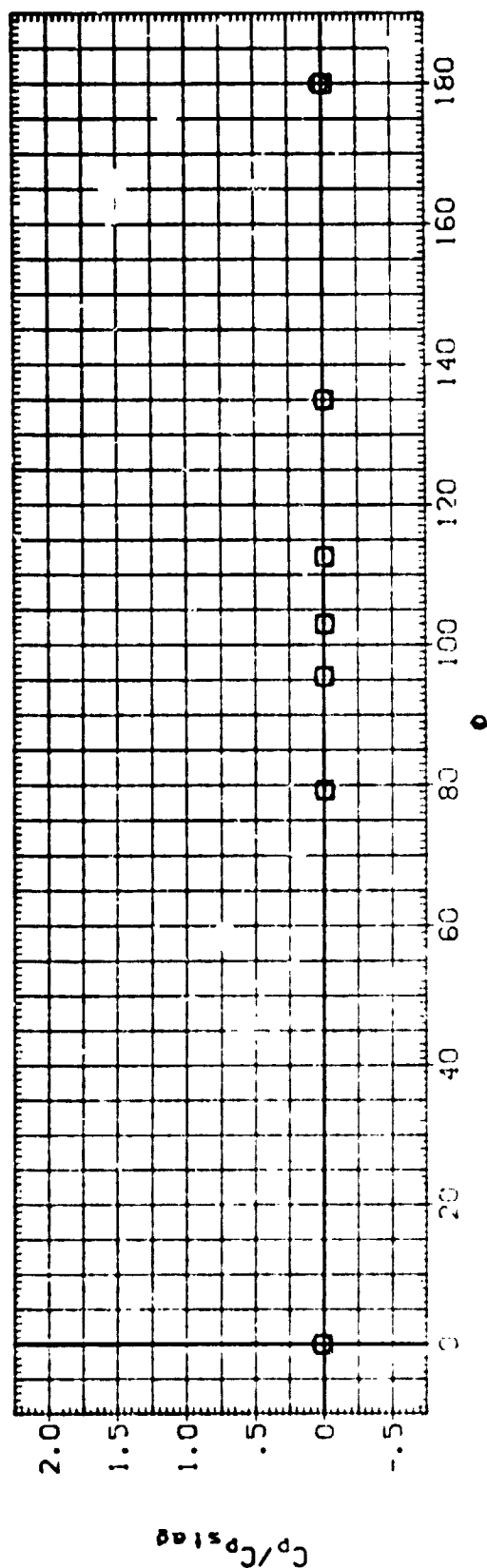
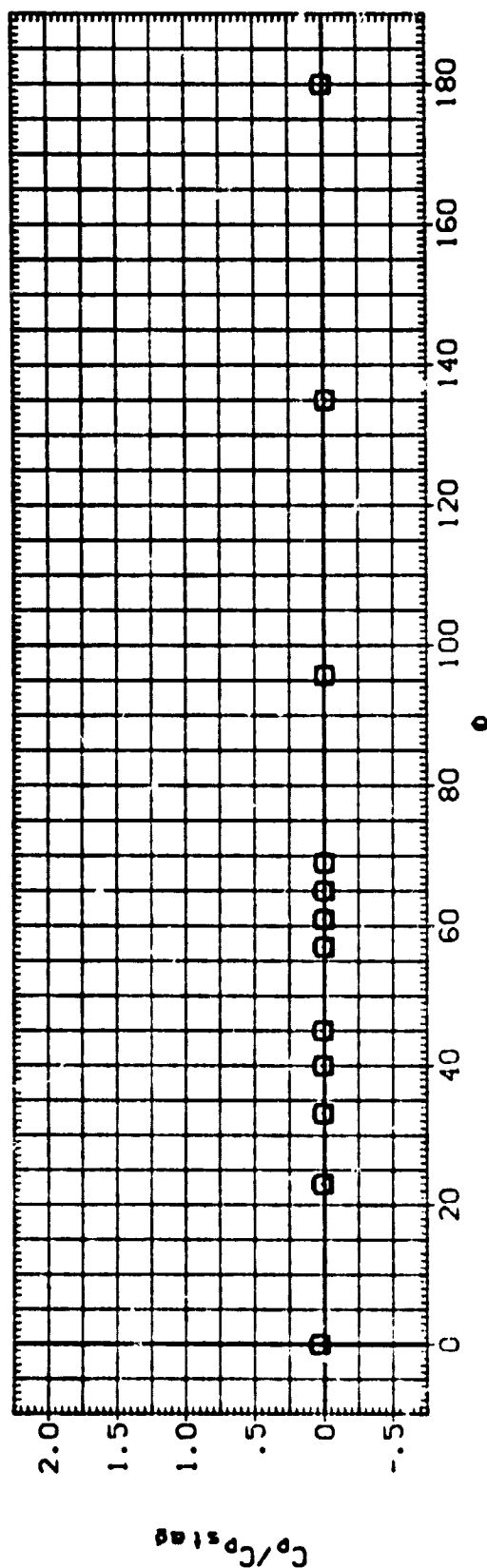


FIG. 28 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER FUSELAGE. BETA= 5. RN/L= 3.0

(RQ3LAE) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/BV MACH
 □ -5.000 .400 3.700
 .000 .250

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

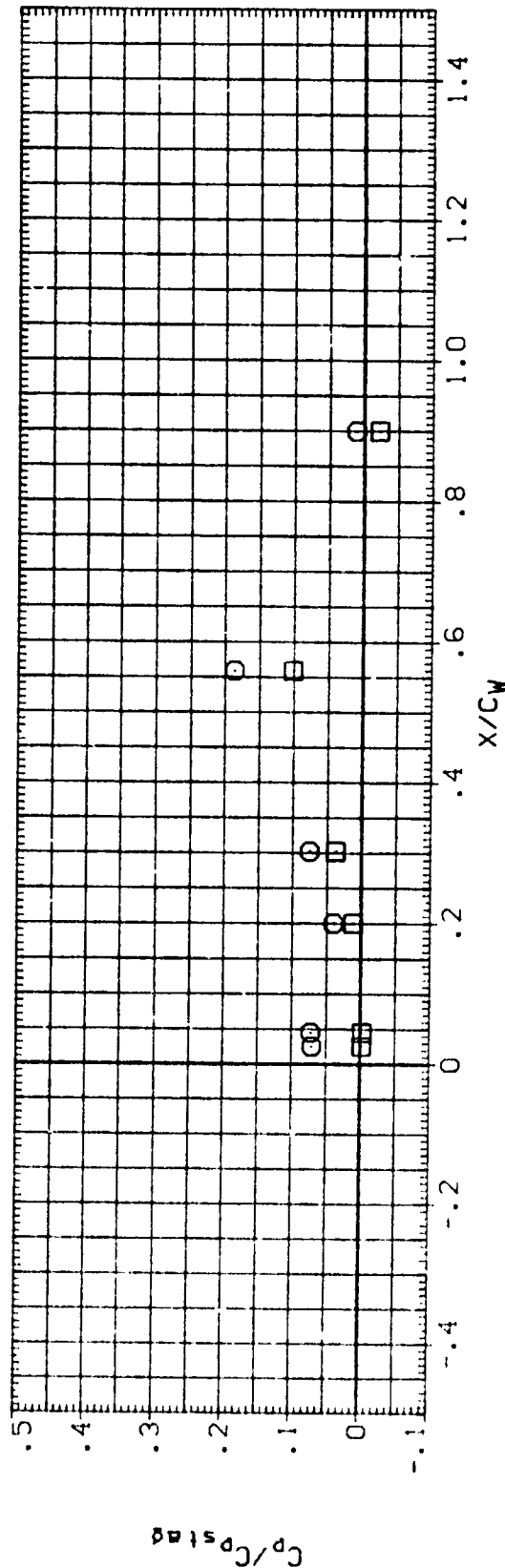
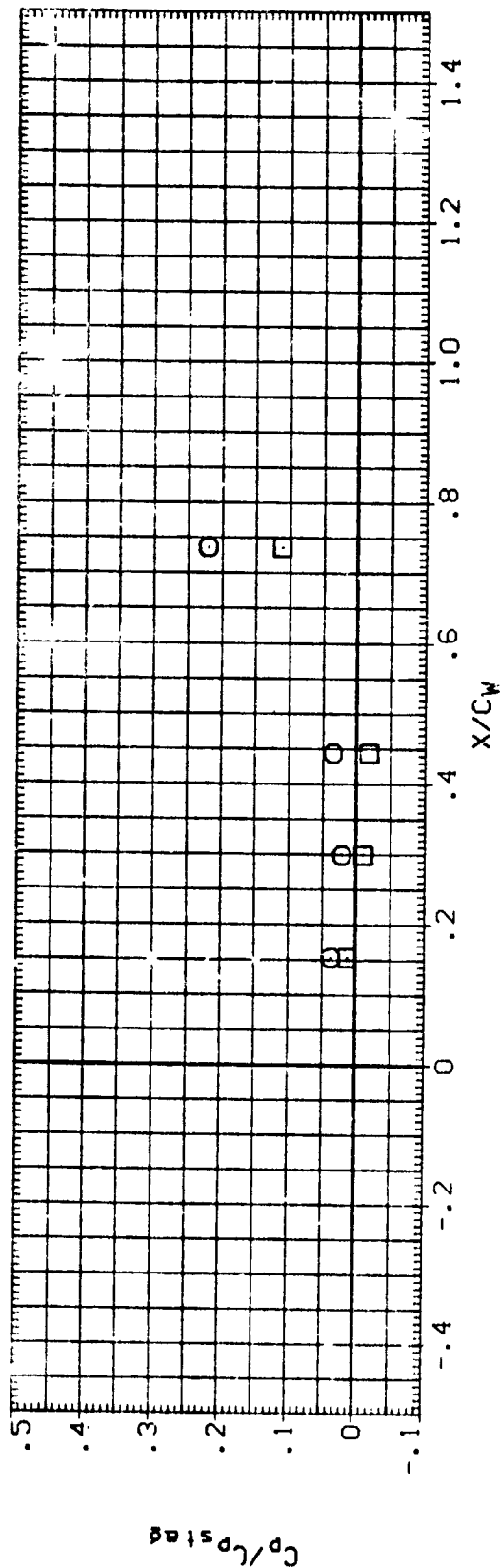


FIG. 29 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, ORBITER LOWER WING. BETA= 5. RN/L= 3.0

(R03LAE) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

ALPHA	2Y/8V	MACH	RN/L	PARAMETRIC VALUES
-5.000	.600	3.700		3.000 BETA
.000	.500			5.000

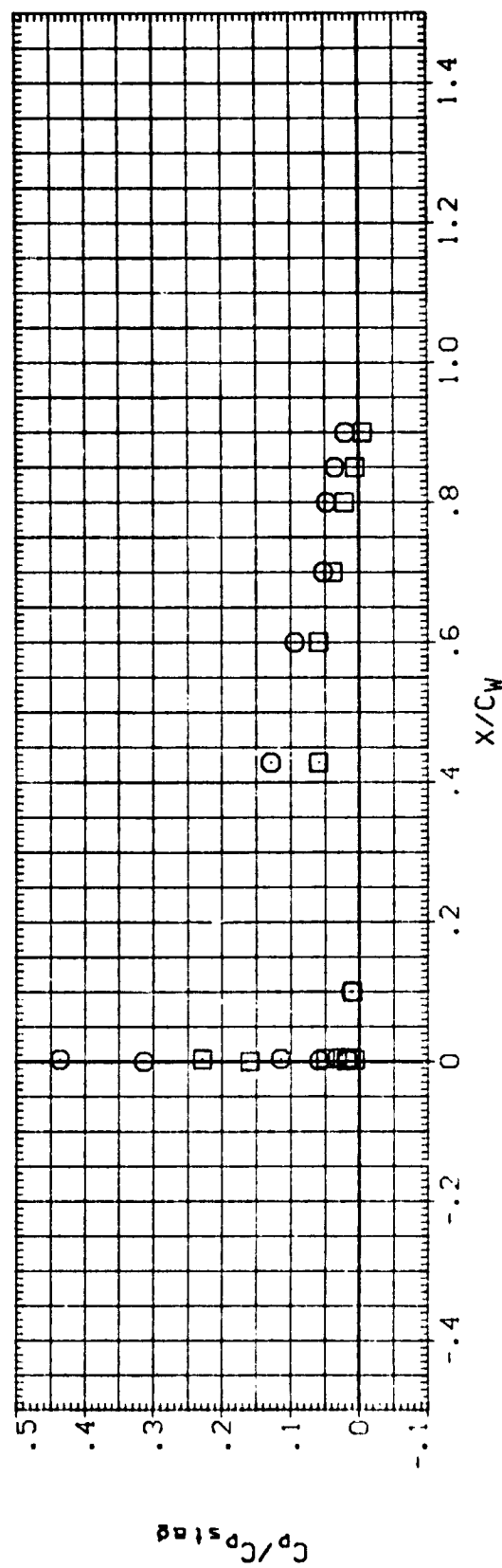
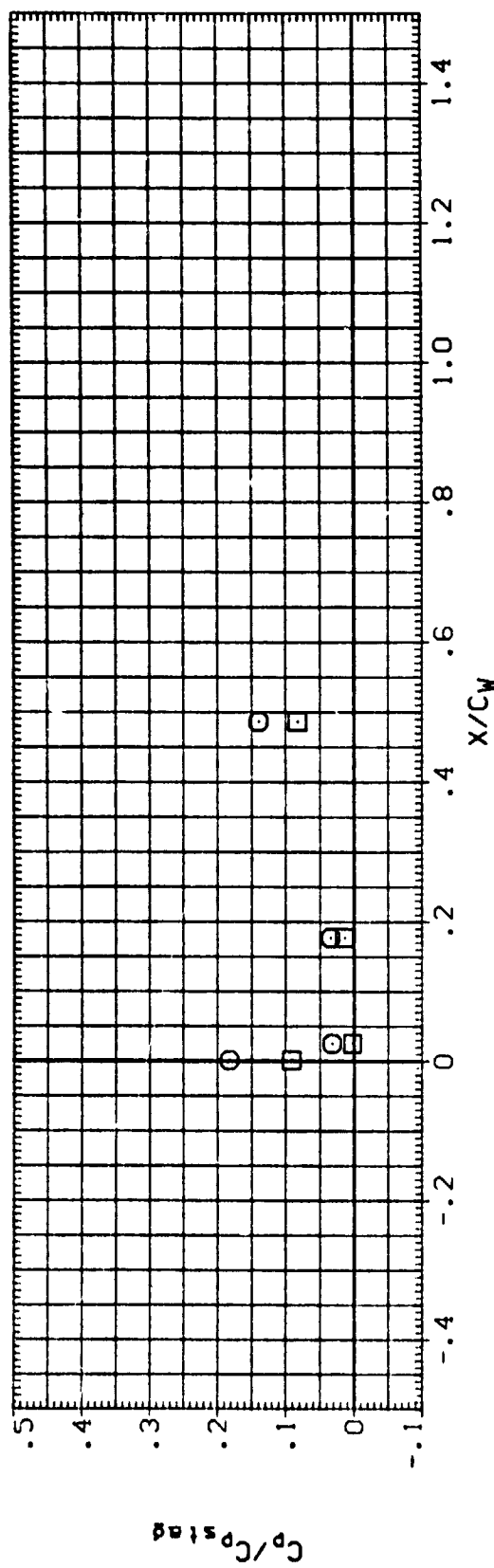


FIG. 29 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 5, RN/L= 3.0

(R03LAE) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/8V MACH
 □ -5.000 .850 3.700

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

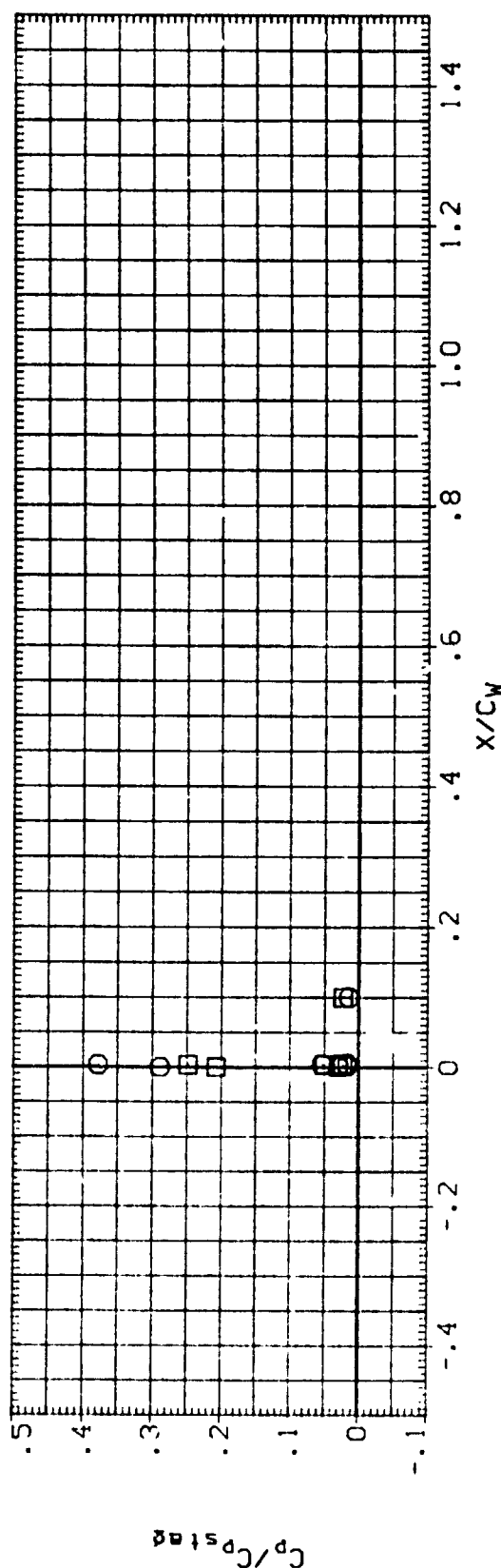
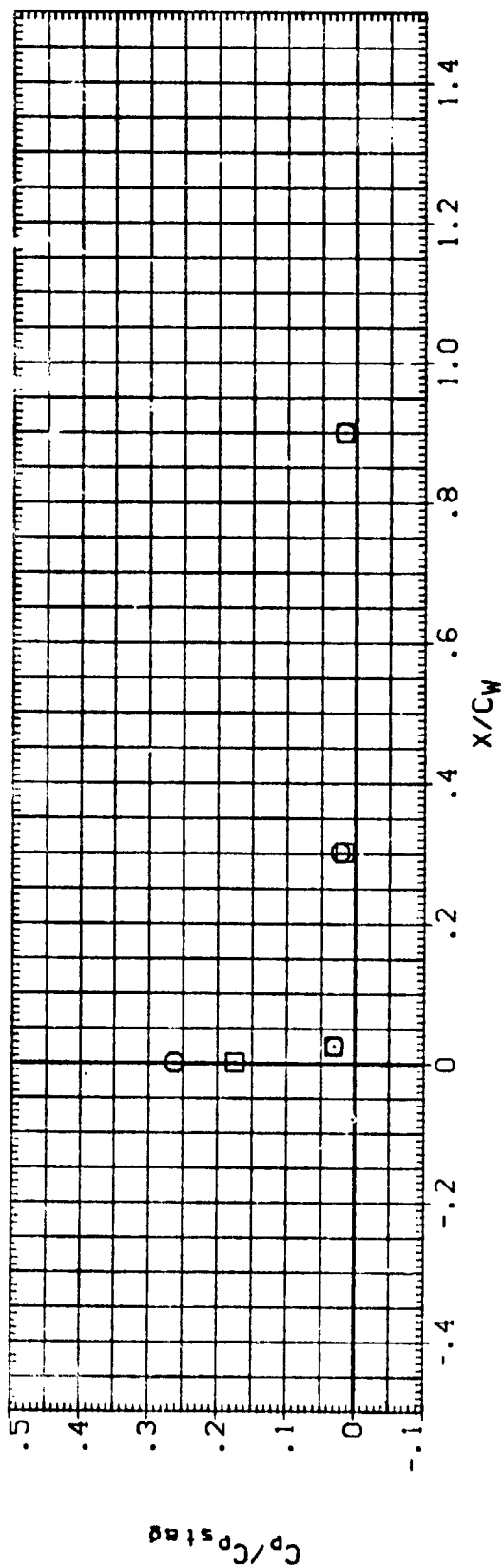


FIG. 29 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 5. RN/L= 3.0

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(RG3LAE) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/B4 MACH
 -5.000 .400 4.600
 .000 .250

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

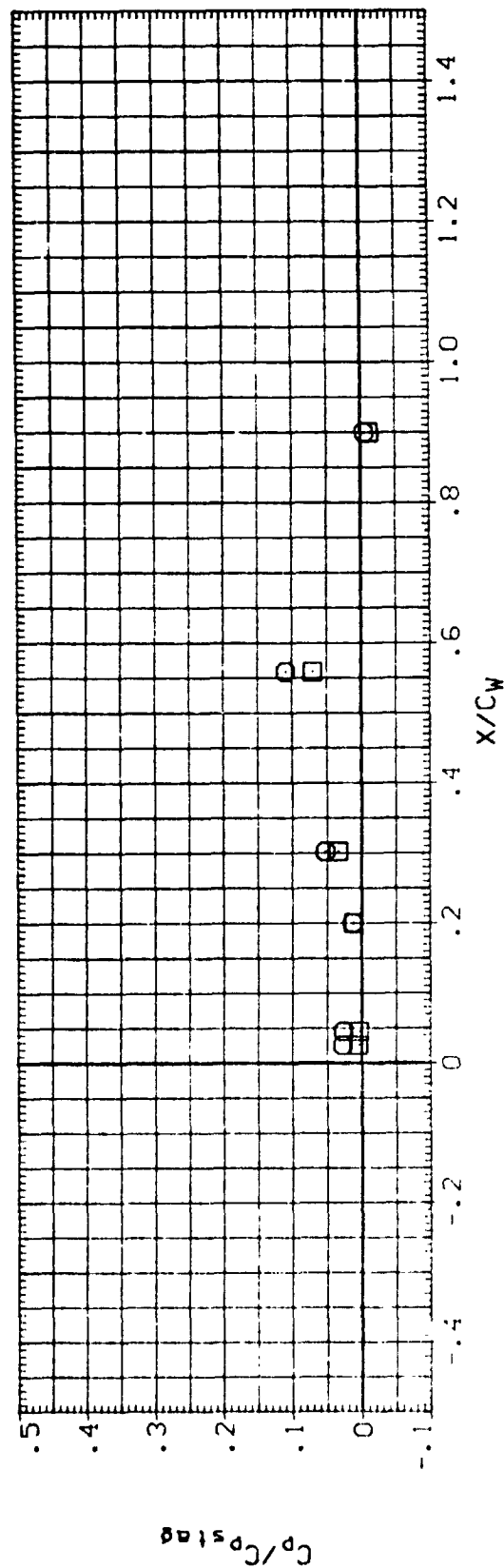
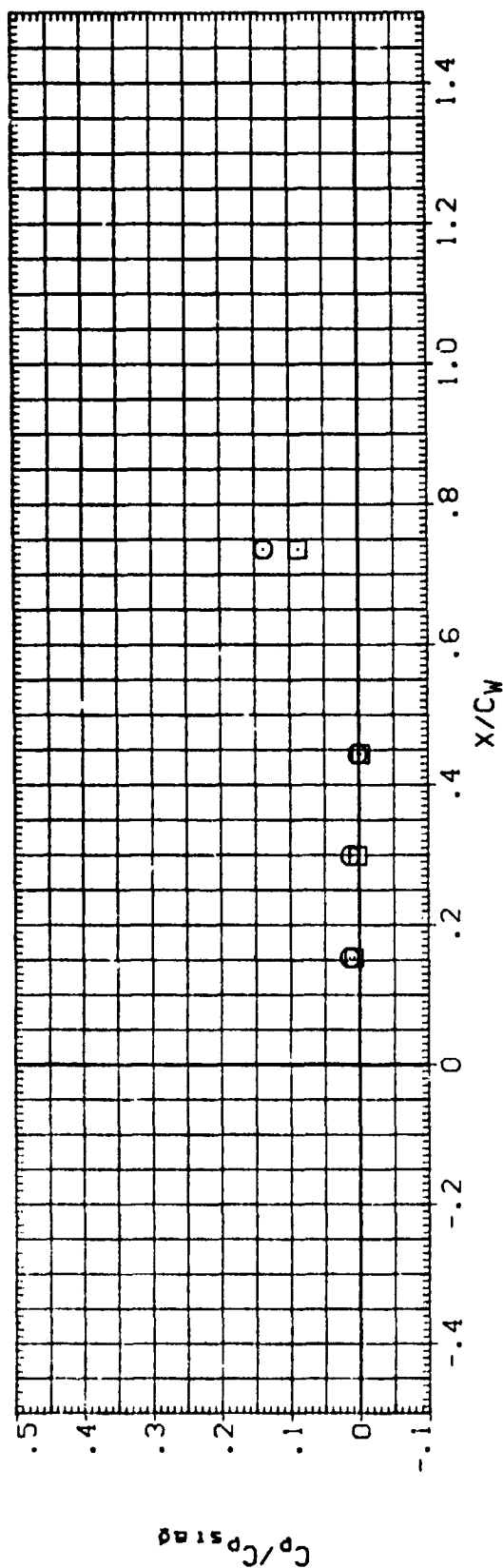


FIG. 29 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 5. RN/L= 3.0

(R03LAEJ) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2V/BV MACH
 -5.000 .600 4.600
 .000 .500

PERCENTAGE VALUE
 3.000 5.0

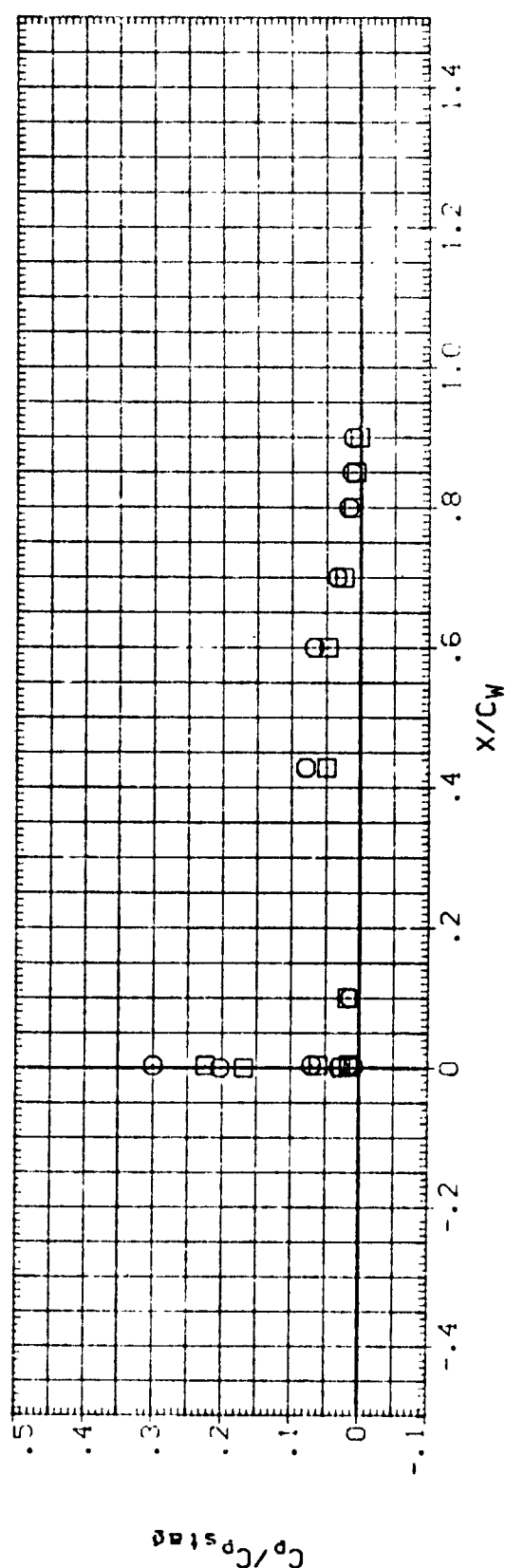
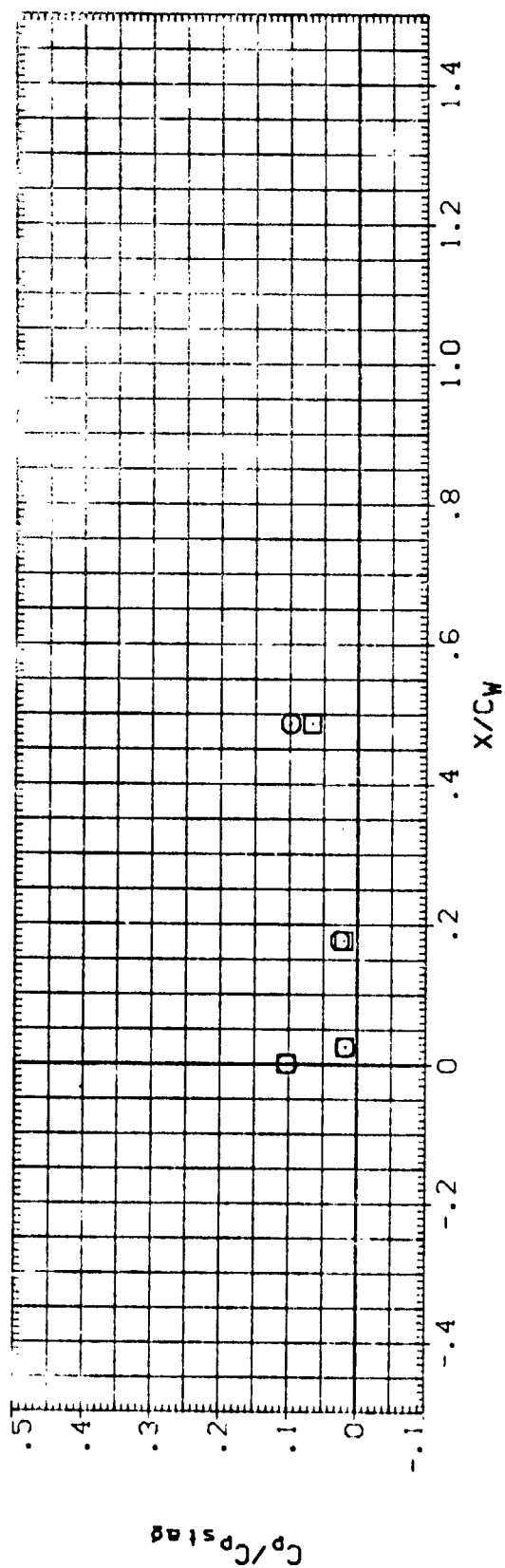


FIG. 29 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. $BETA=5$, $RN/L=3.0$

(RQ3LAE) UPWT 1059 (IH4) 01-T15-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2Y/8V	MACH	RV/L	PARAMETRIC VALUES
□	-5.000	.850	4.600		3.000 BETA
□	.000	.750			5.000

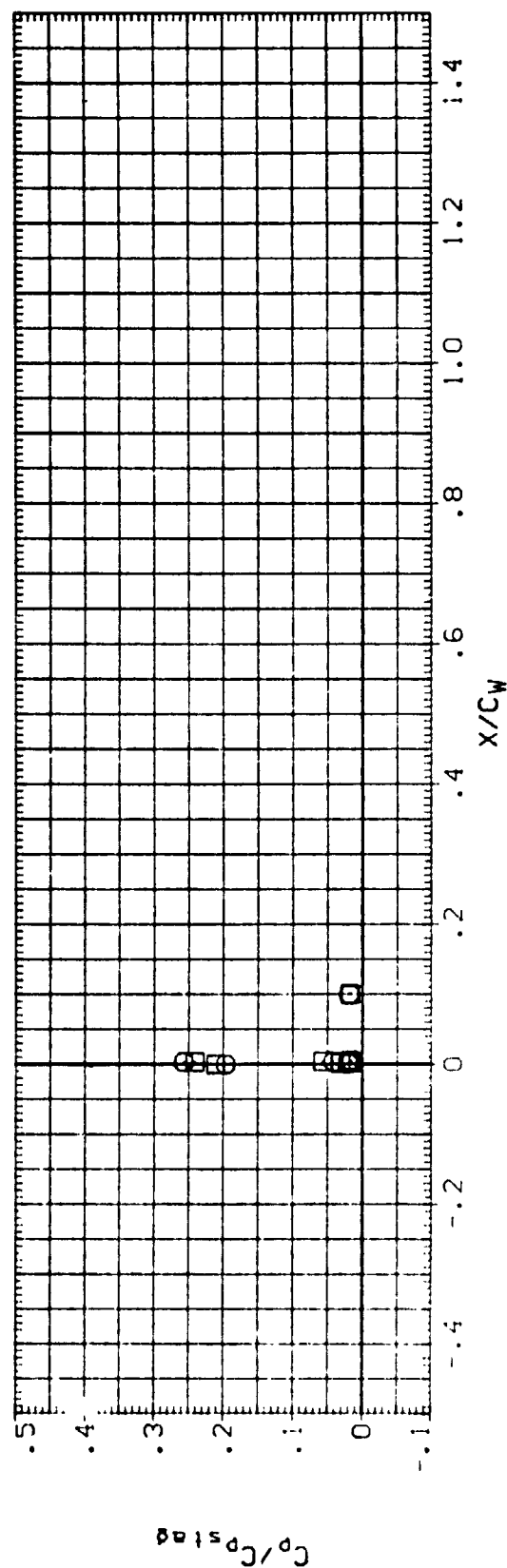
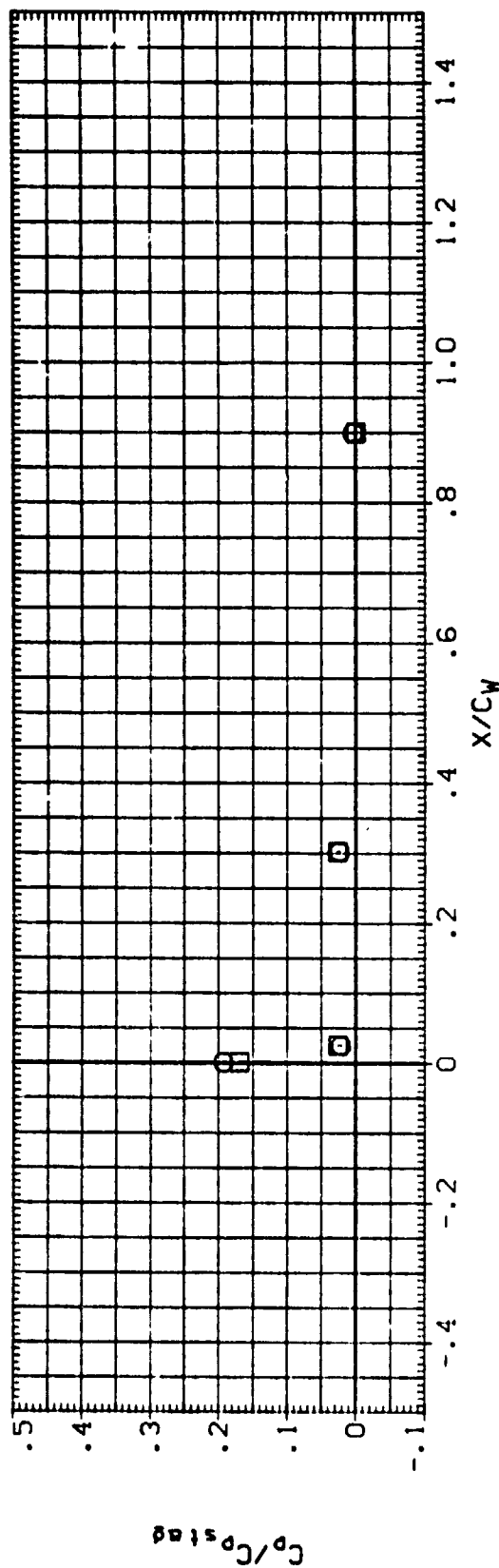


FIG. 29 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER LOWER WING. BETA= 5. RN/L= 3.0

(RQ3UAE) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL ALPHA 2Y/BW MACH
 -5.000 .800 3.700
 .000 .600
 .400

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

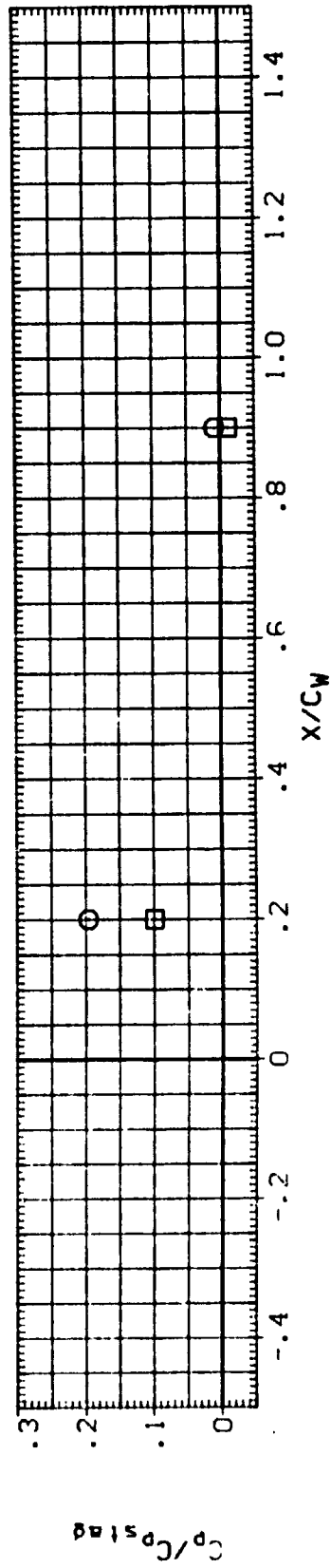
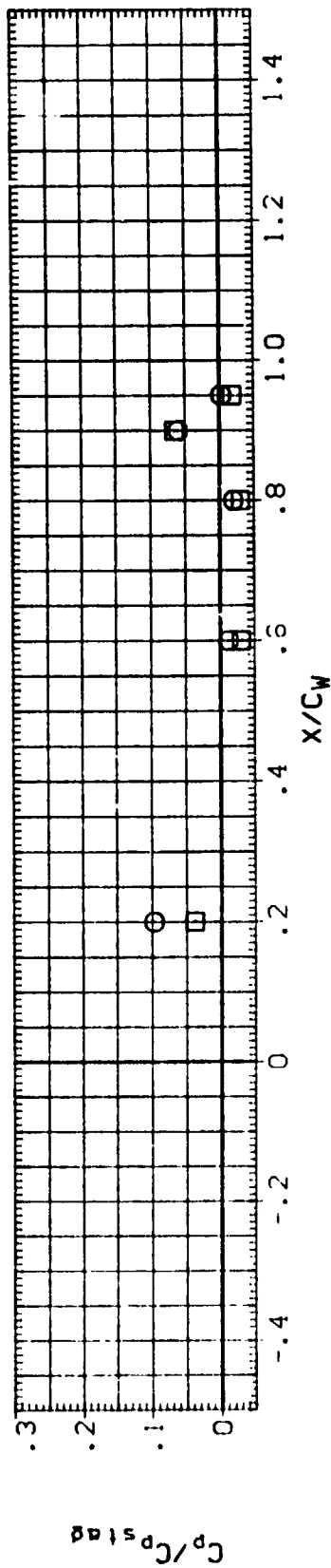
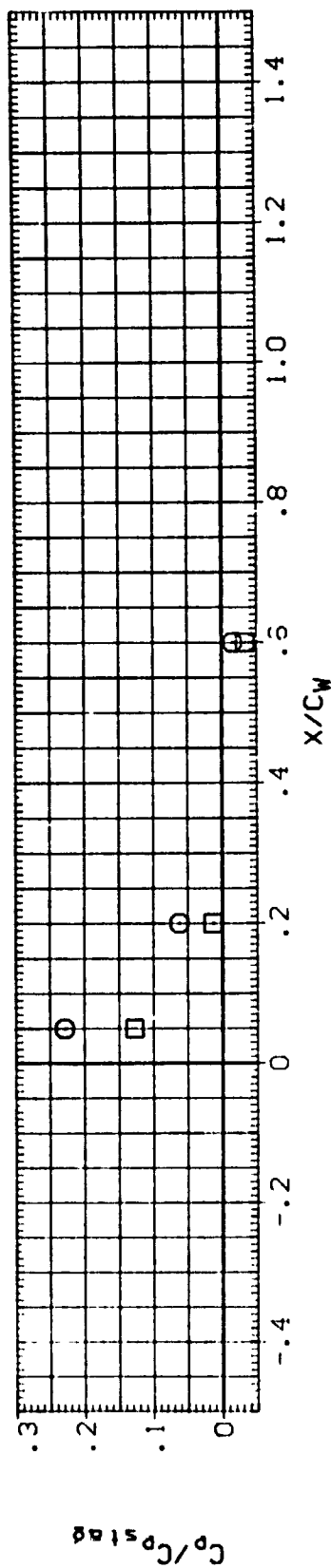


FIG. 30 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING. BETA= 5. RN/L= 3.0

(R03UAE) UPWT 1059 (IH4) 01-T15-S8N16 ORB. UPPER WING

SYMBOL	ALPHA	2V/BV	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	.800	4.600		3.000 BETA
○	.000	.600			
		.400			

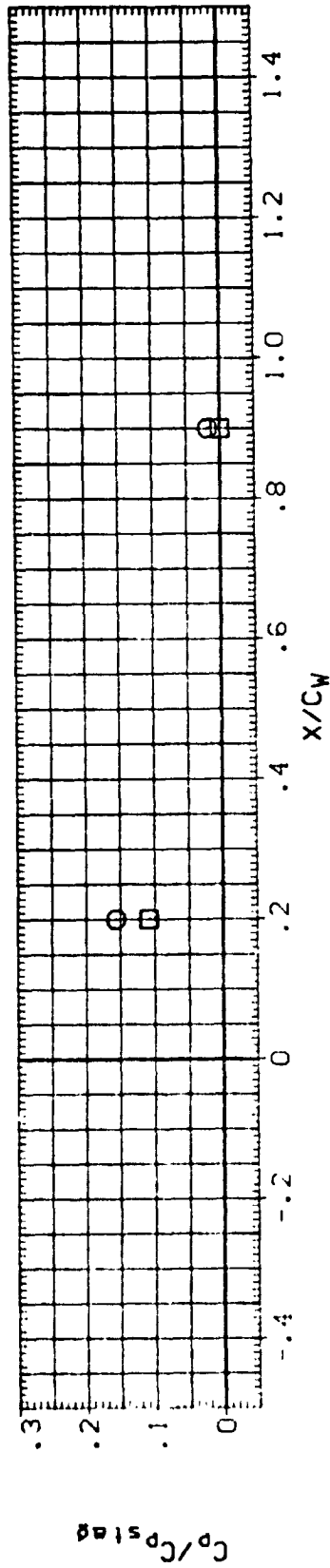
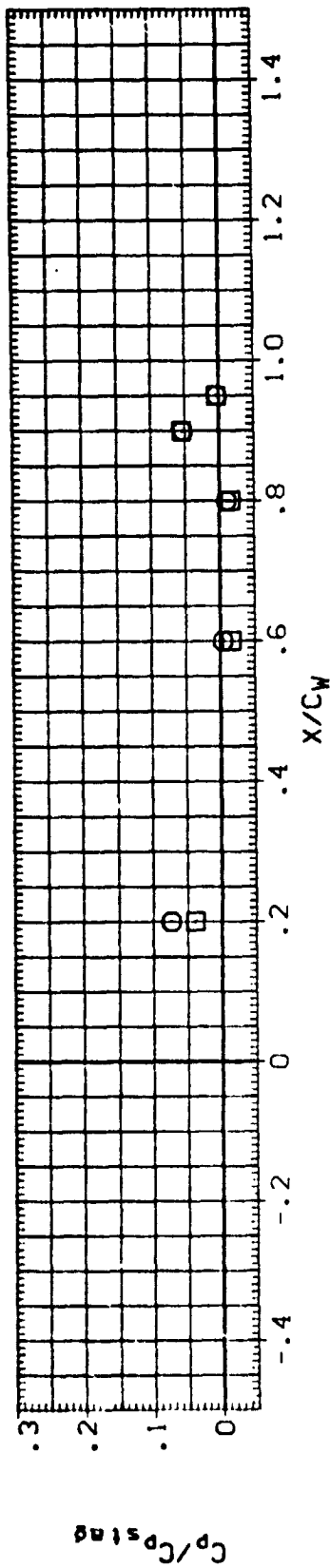
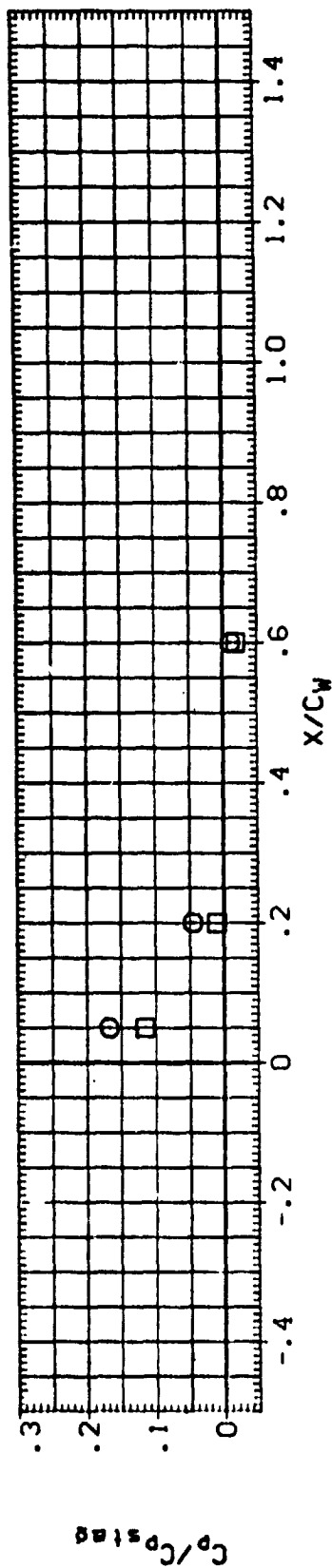


FIG. 30 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER UPPER WING. BETA= 5. RN/L= 3.0

(R03VAE) UPWT 1059 (IH4) 01-T15-S8N16 OR8. VERT. TAIL

SYMBOL ALPHA
-5.000
.000

Z/BV
.299
.532
.765

PARAMETRIC VALUES
RN/L 3.000 BETA 5.000

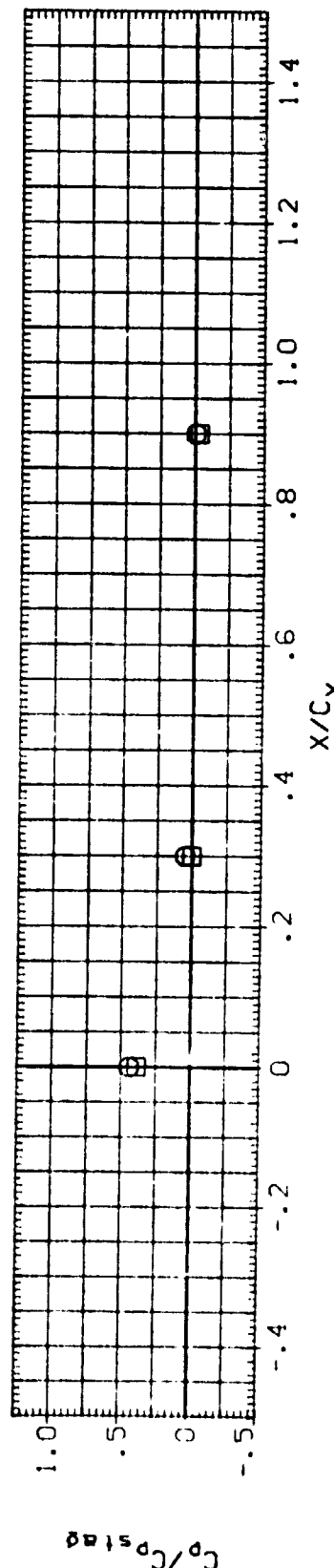
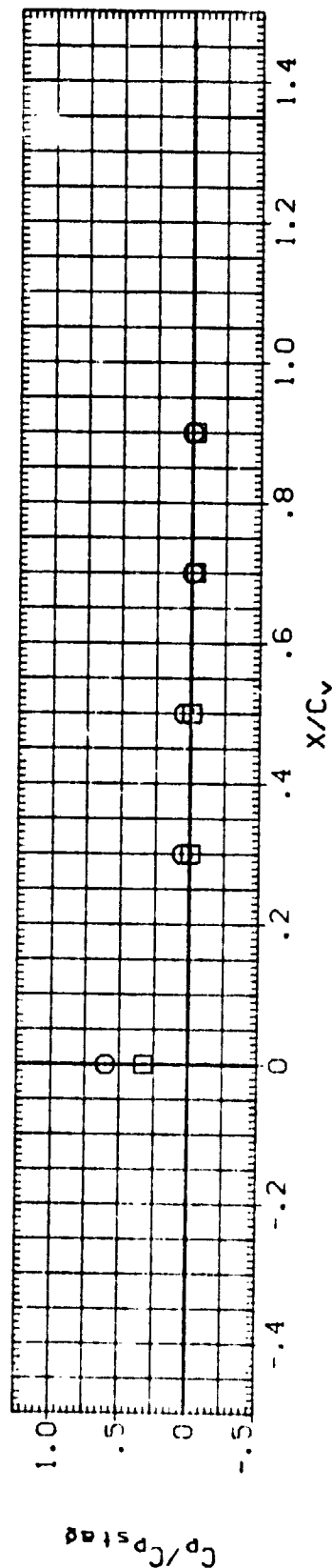
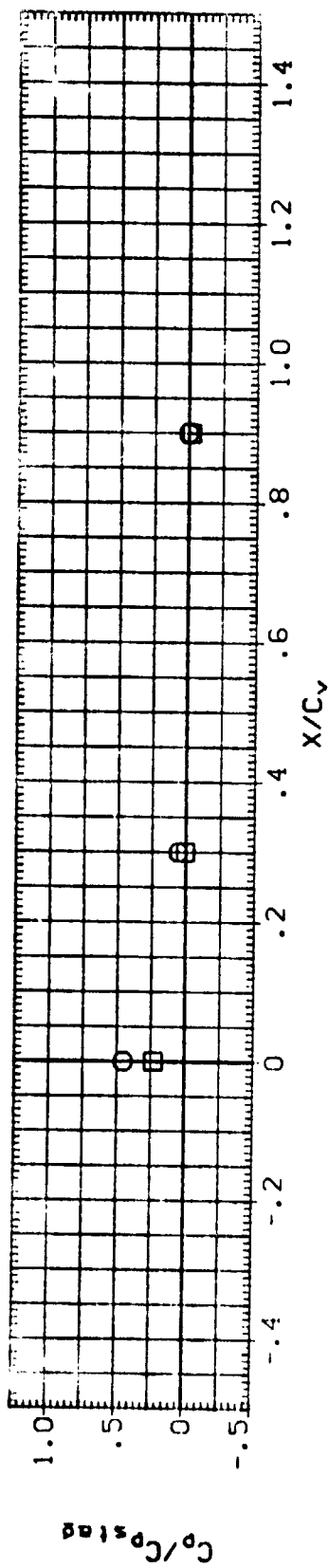


FIG. 31 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 5. RN/L= 3.0

[RQ3VAE] UPWT 1059 (IH4) 01-T15-S8N16 ORB. VERT. TAIL

SYMBOL A_L PHA
-5.000 .000

Z/BV MACH
.299 4.600
.532
.765

PARAMETRIC VALUES
RN/L 3.000 BETA 5.000

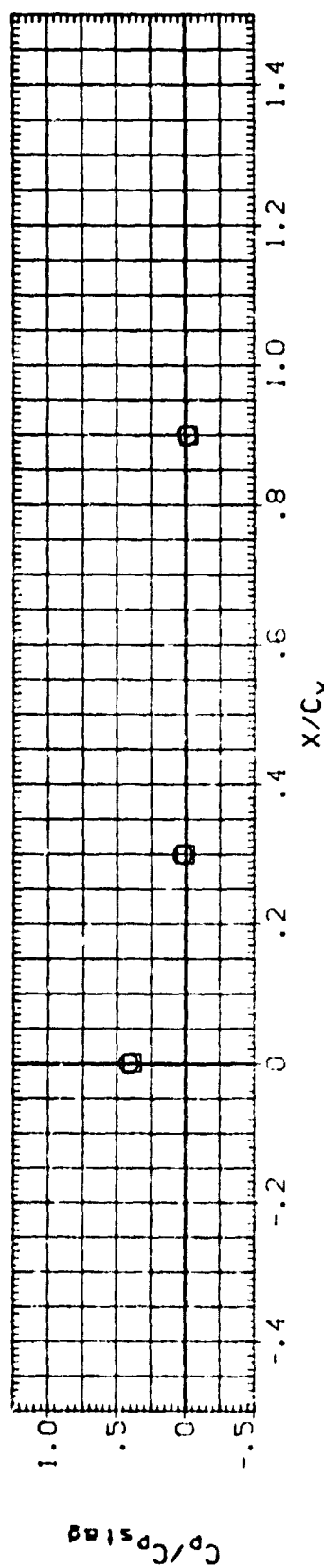
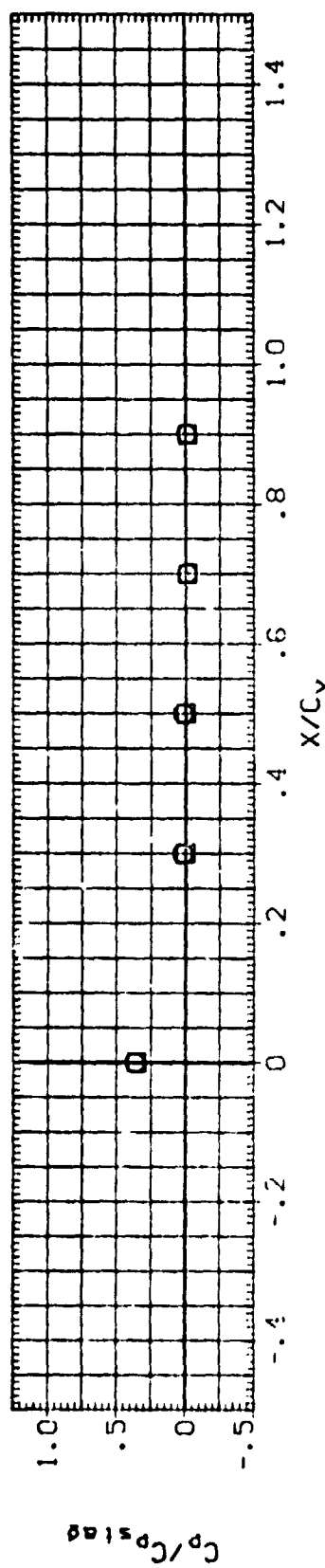
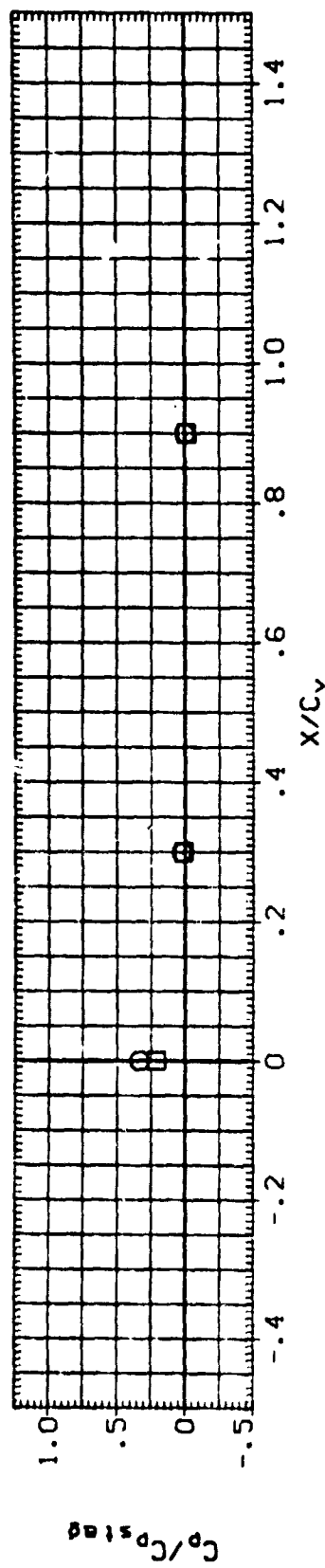


FIG. 31 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. ORBITER VERTICAL TAIL. BETA= 5. RN/L= 3.0

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

[RQ3TAE] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
-5.000 67.500 3.700
.000

PARAMETRIC VALUES
RN/L 3.000 BETA 5.000

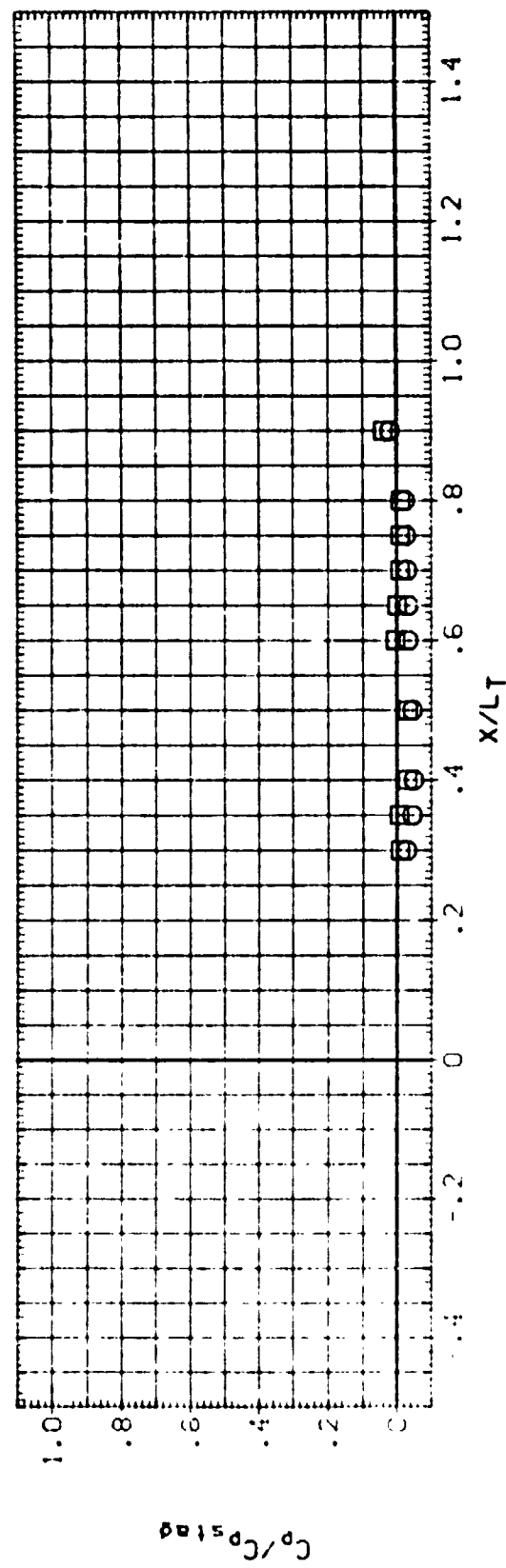
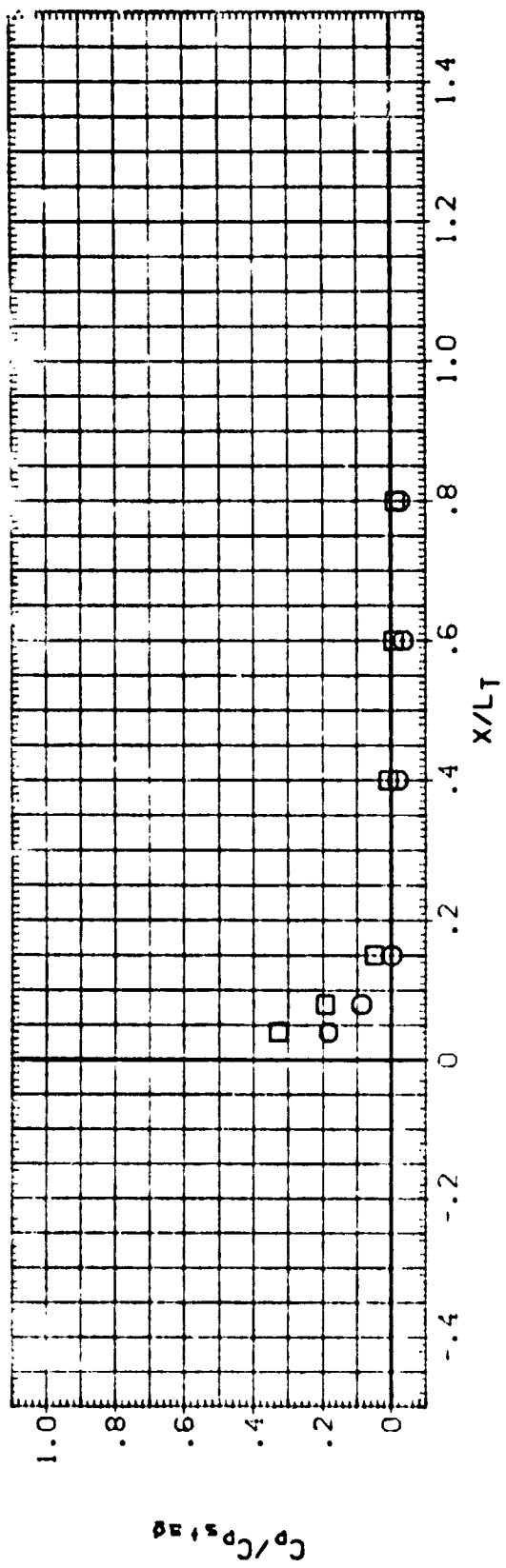


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

(R037AE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 □ -5.000 112.500 3.700
 ○ .000 90.000

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

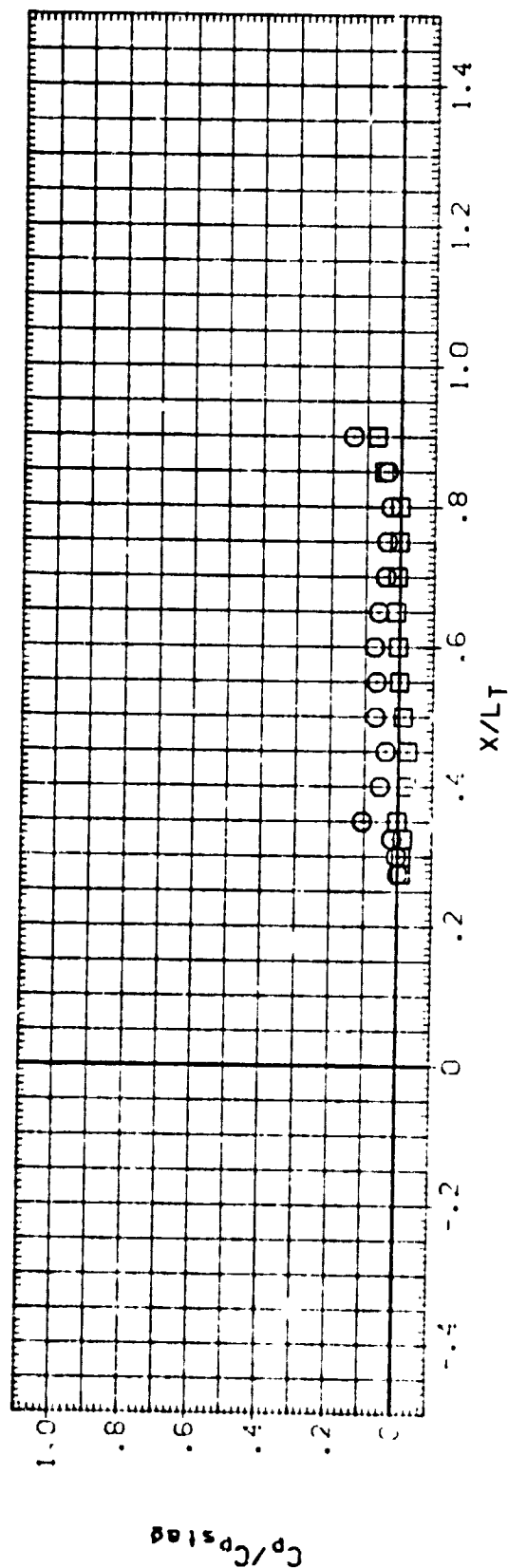
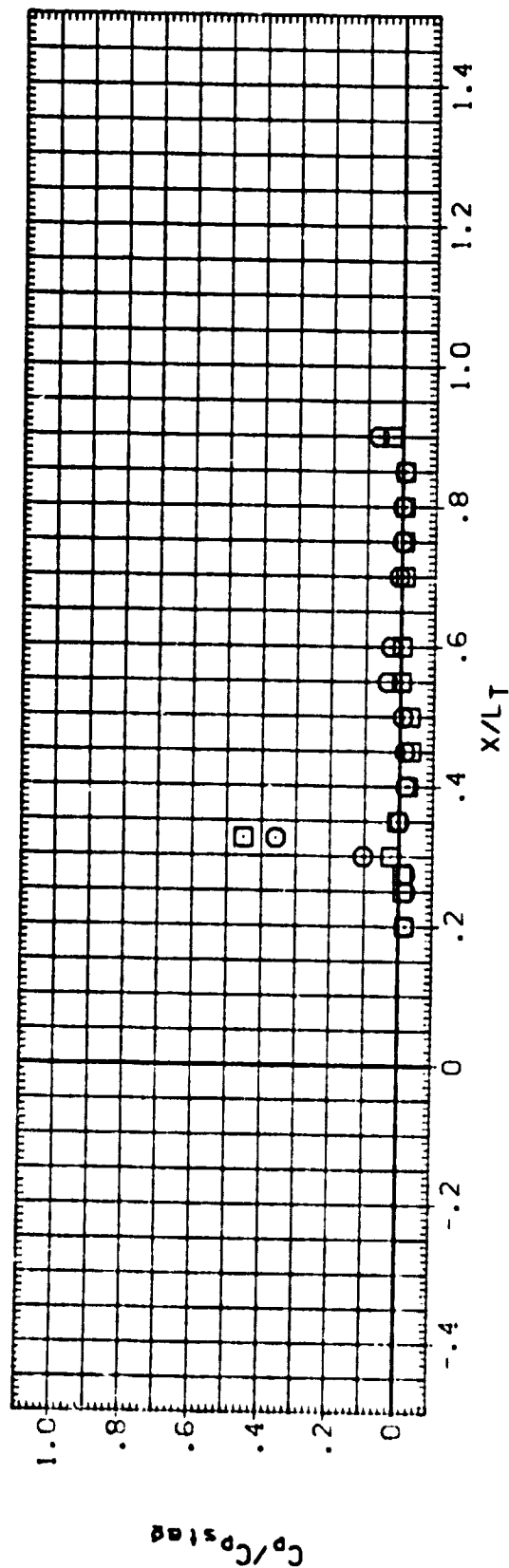


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 □ -5.000 135.000 3.700

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

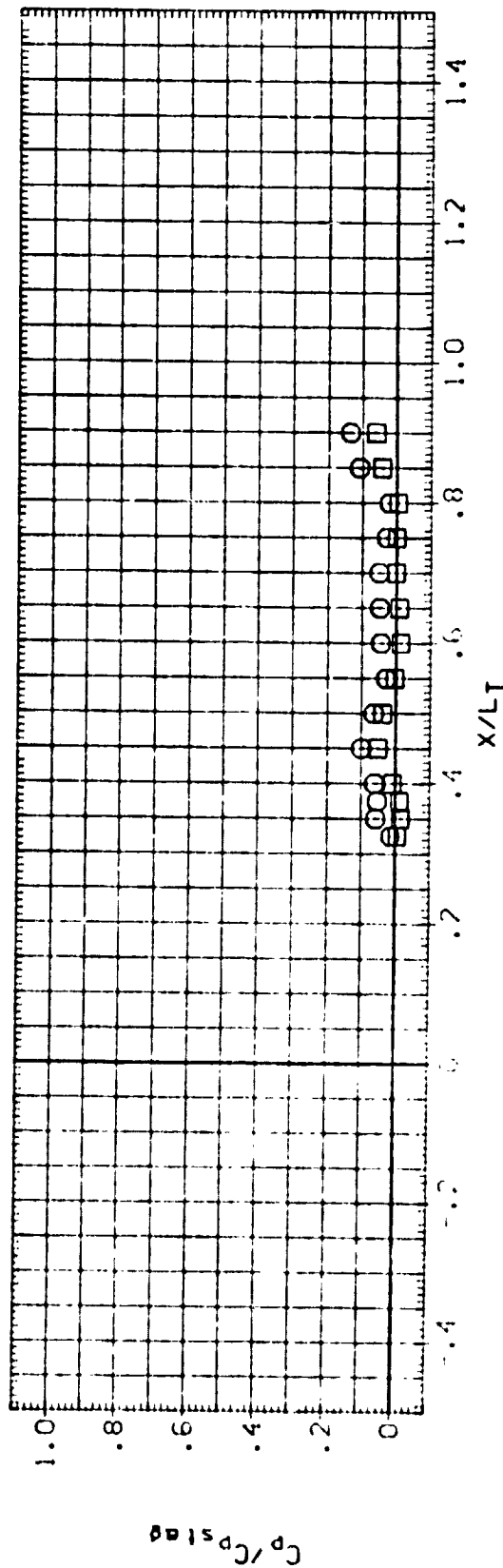
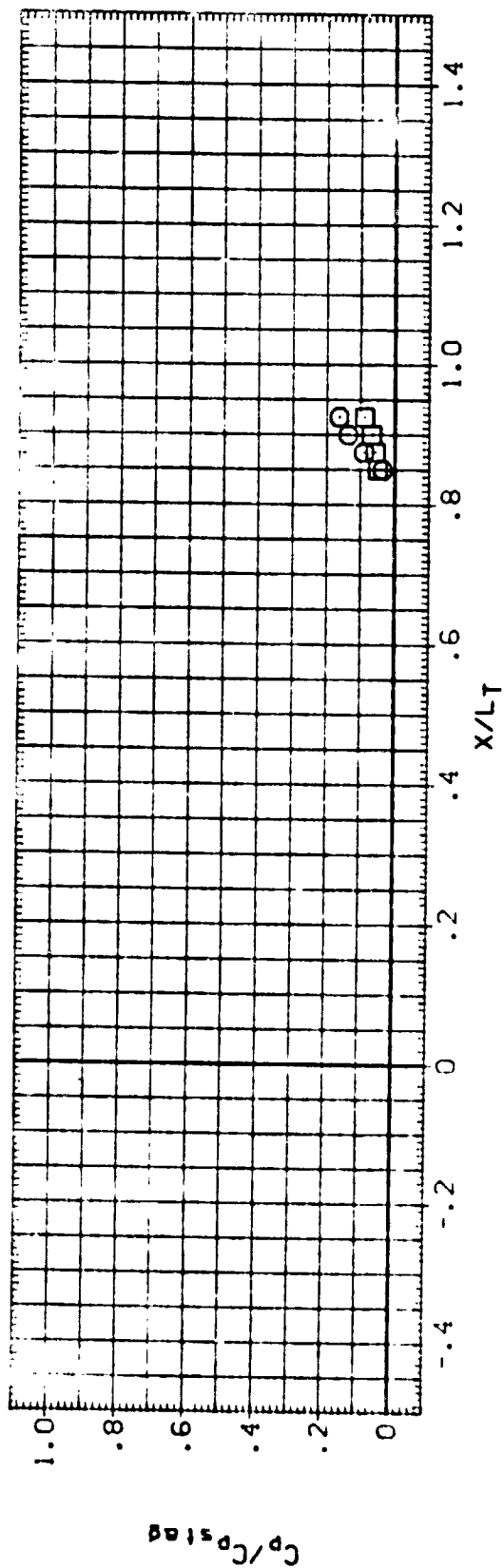


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

[R03TAE] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA T-BETA
-5.000 18.000 3.700
.000 157.500

PARAMETRIC VALUES
RN/L 3.000 BETA 5.000

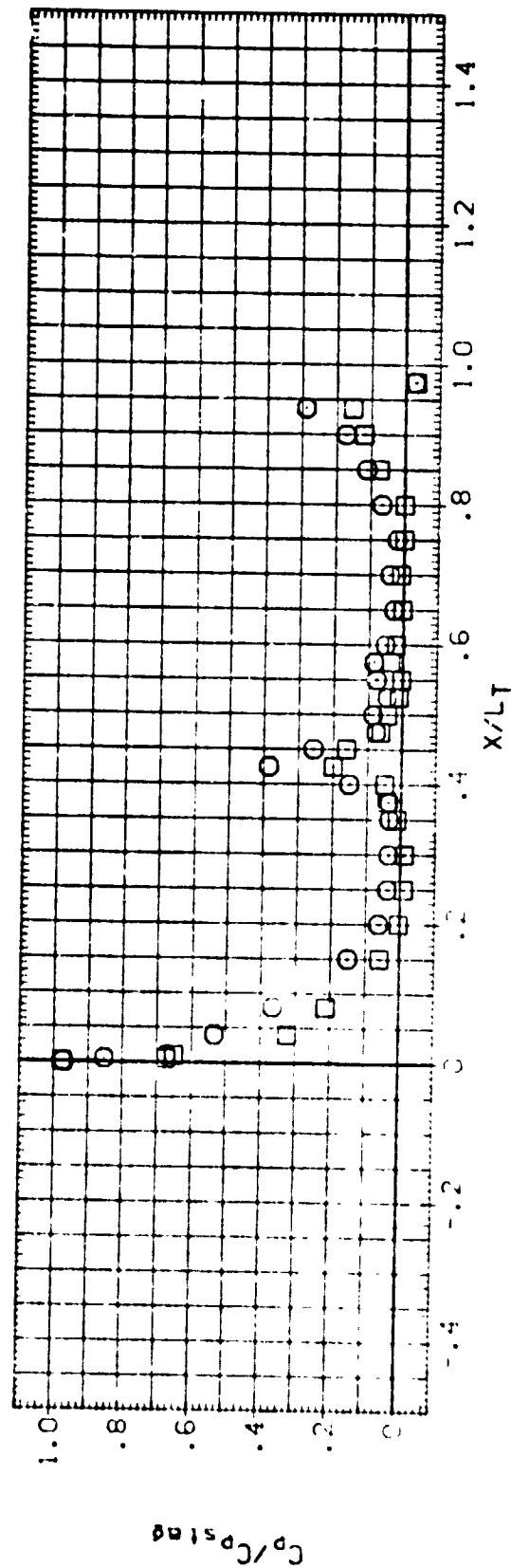
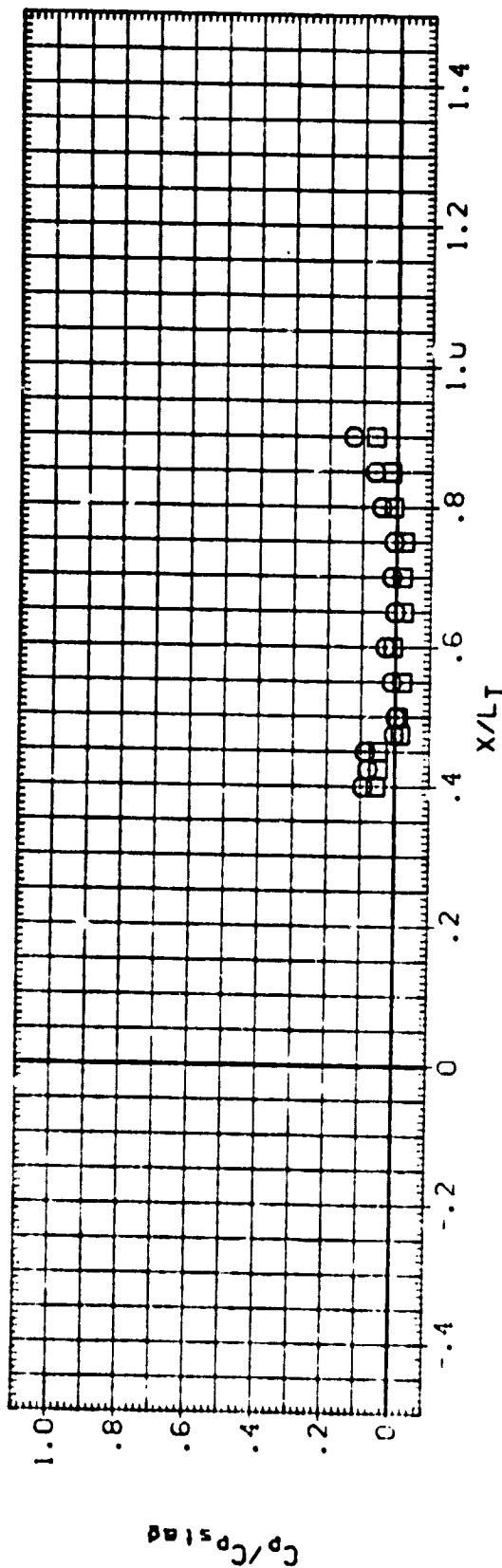


FIG. 32 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 5. RN/L = 3.0

(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH
□	-5.000	210.000	3.700
○	.000	197.000	

PARAMETRIC VALUES
RN/L 3.000 BETA 5.000

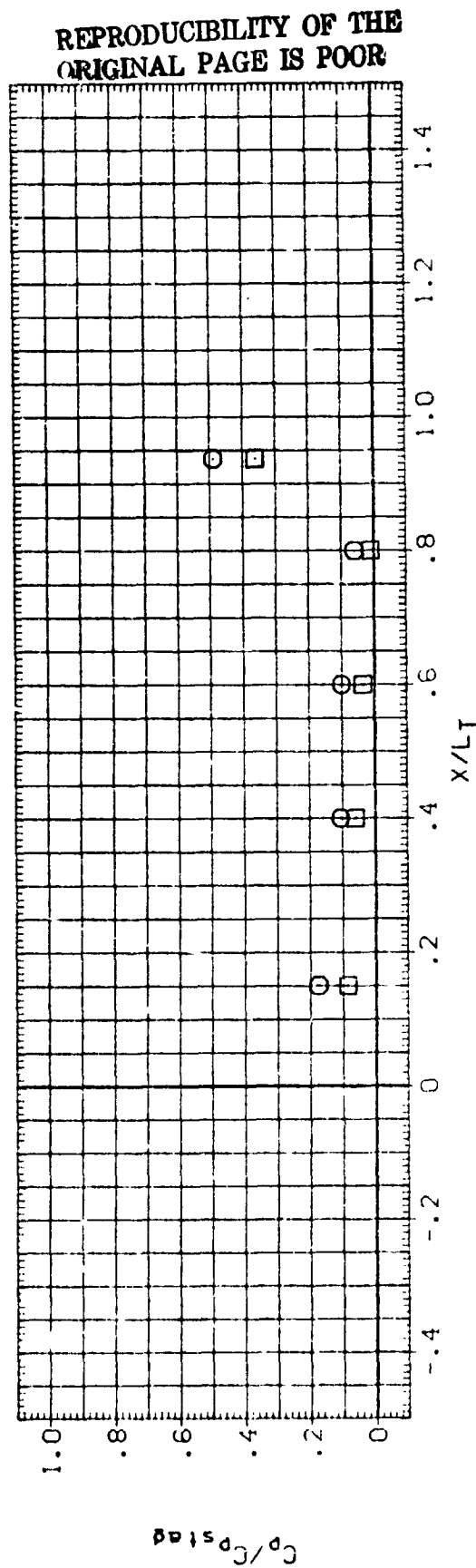
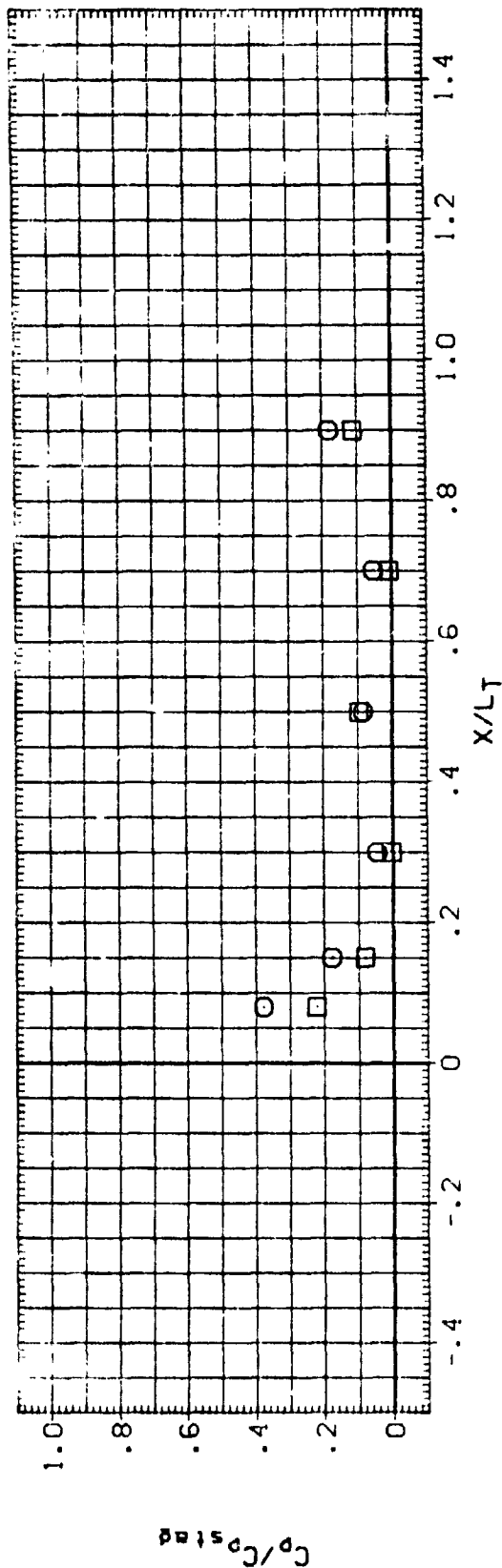


FIG. 32 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	RN/L	PARAMETRIC VALUES
□	-5.000	67.500	4.600		3.000 BETA 5.000
○	.000				

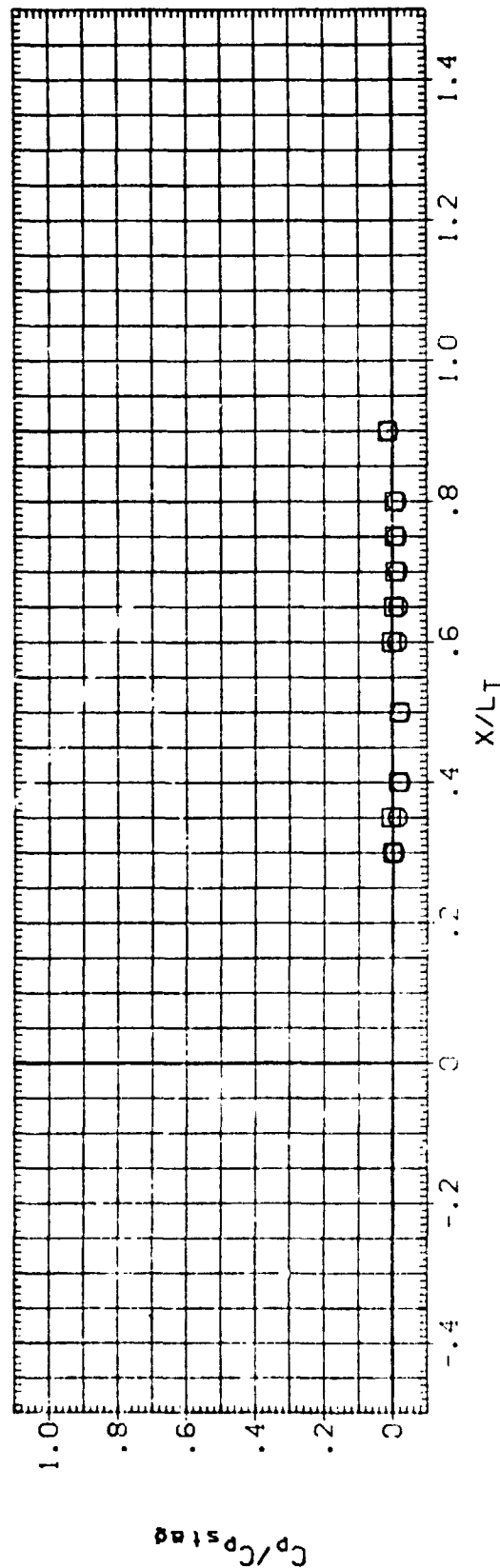
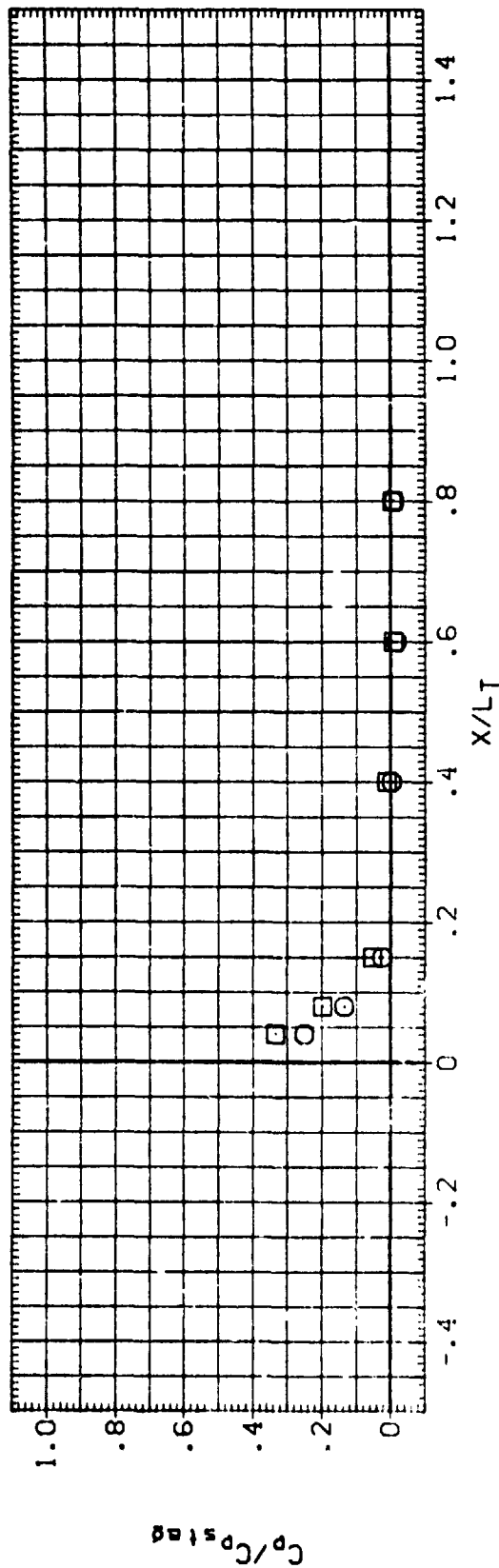


FIG. 32 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, $\beta = 5$, $RN/L = 3.0$

(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PAR/METRIC VALUES
 RN/L 3.000 BETA 5.000

SYMBOL ALPHA THETA MACH
 -5.000 112.500 4.600
 .000 90.000

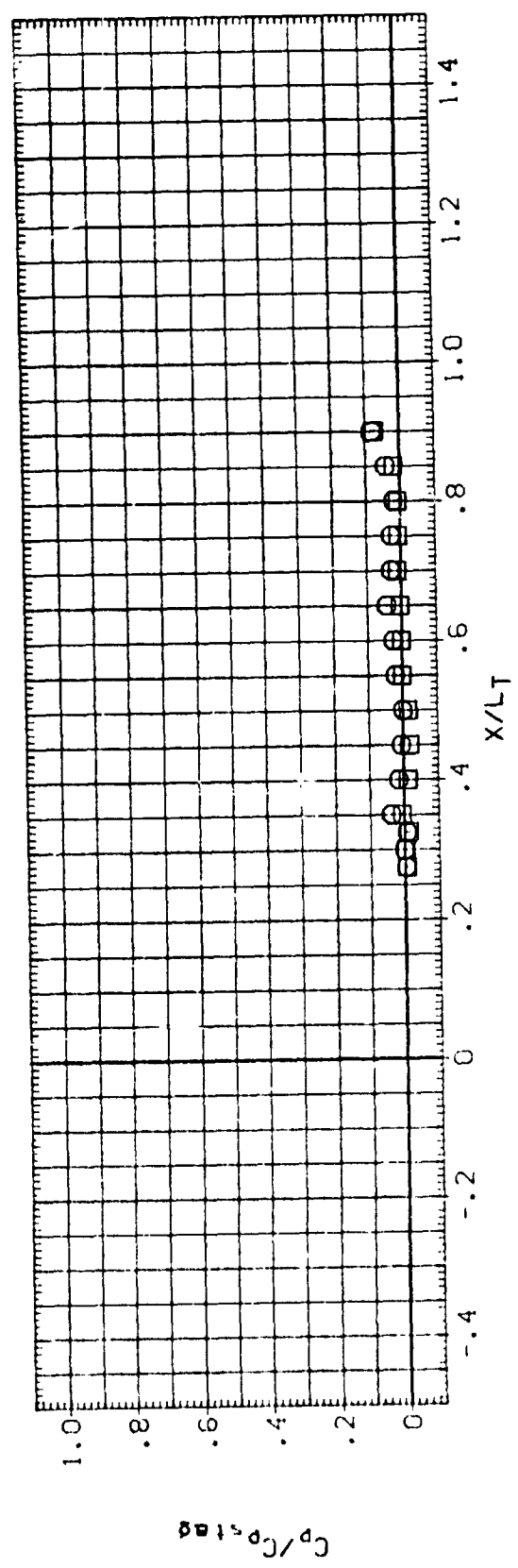
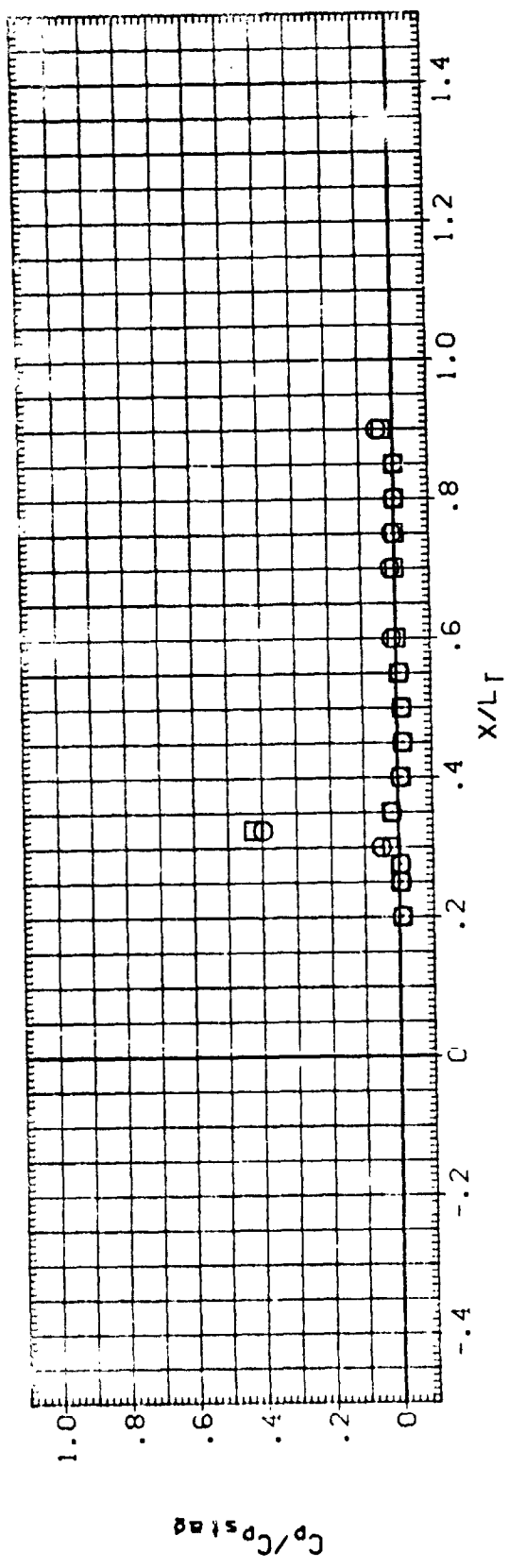


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0 PAGE 376

(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 B -5.000 135.000 4.600
 .000 123.000

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

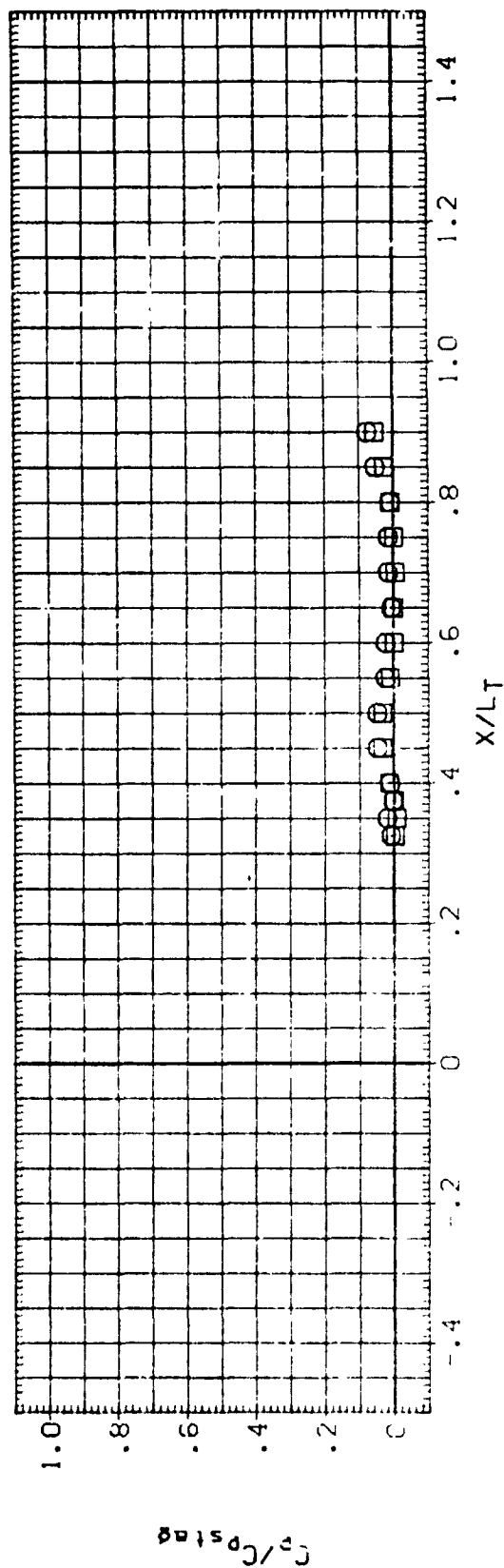
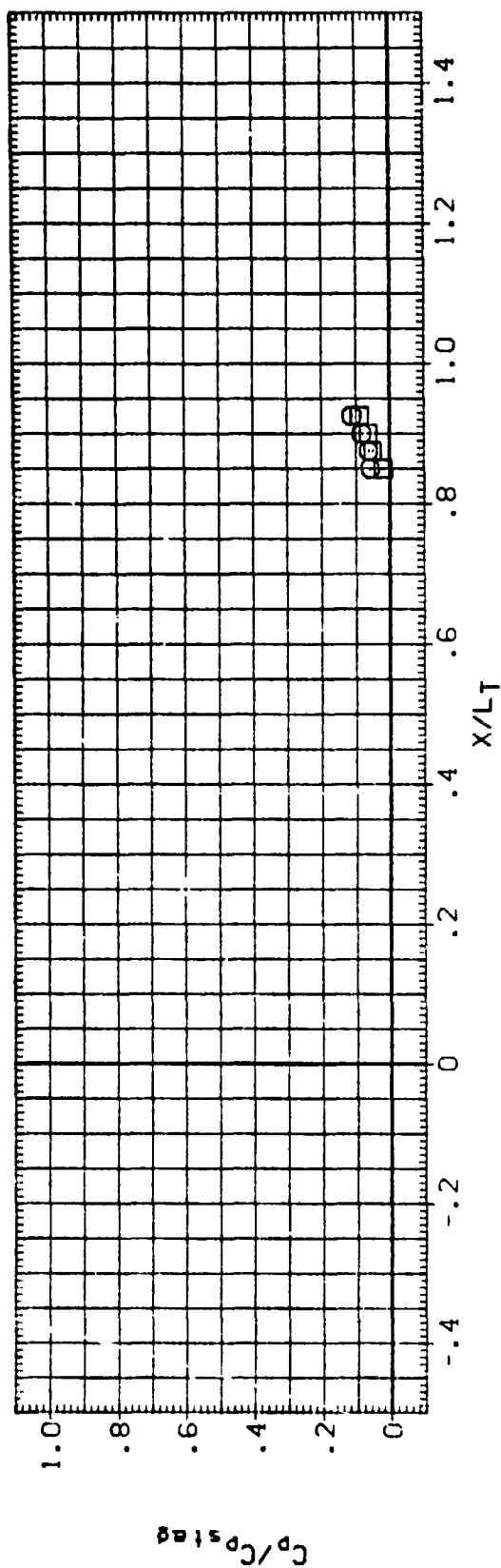


FIG. 32 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, BETA = 5, $RN/L = 3.0$

(R03TAE) UPWT 1059 H4) 01-T15-S8N16 EXTERNAL TANK
 SYMBOL ALPHA BETA MACH
 -5.000 120.000 4.600
 0 157.500

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

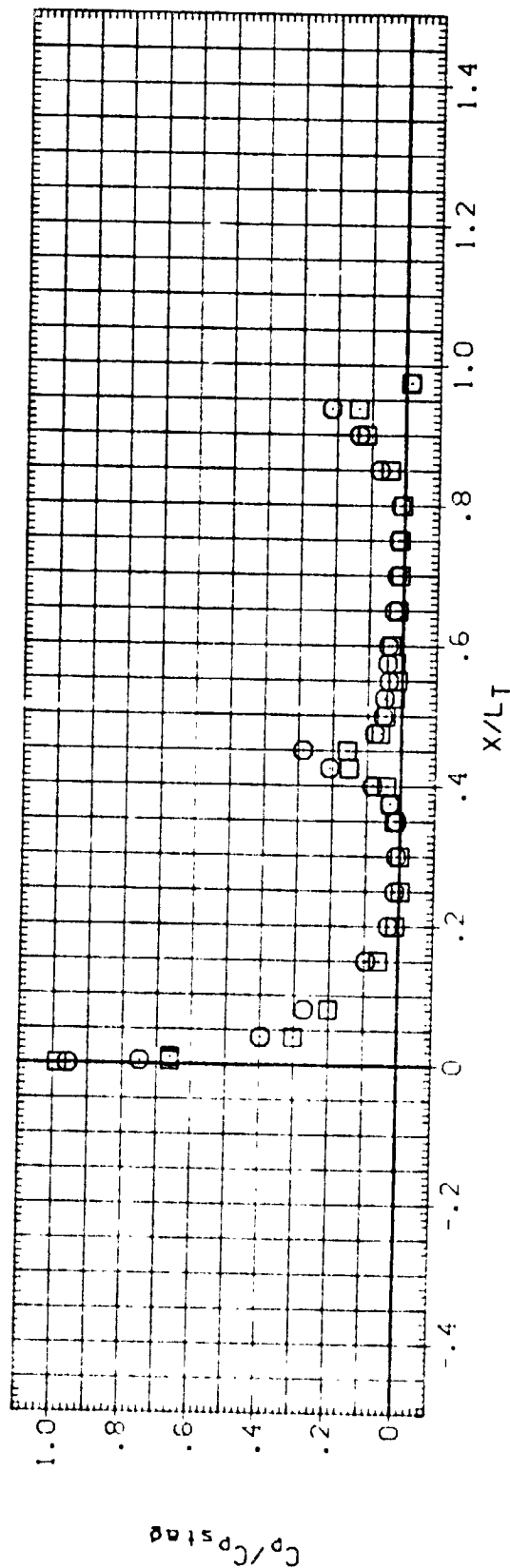
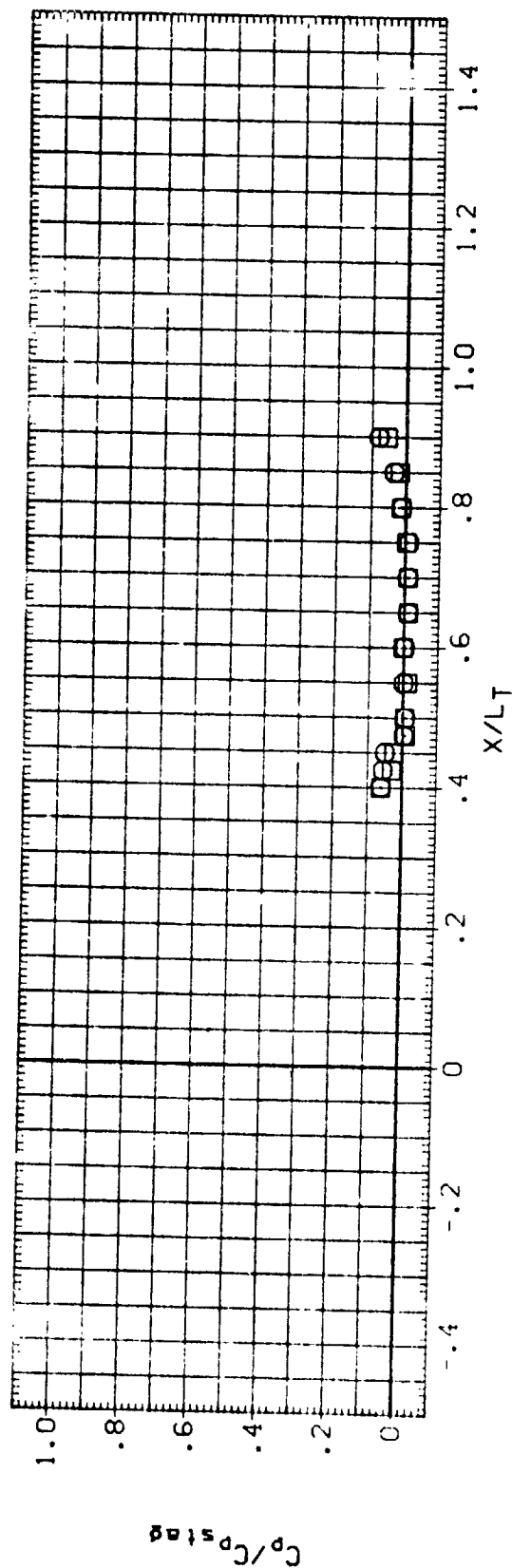


FIG. 32 VARIATION OF C_p/C_{pstag} ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK. BETA= 5. RN/L= 3.0

(R03TA1) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
 3.000 BETA 5.000

RN/L

ALPHA
 -5.000 210.000
 .000 197.000

MACH
 4.600

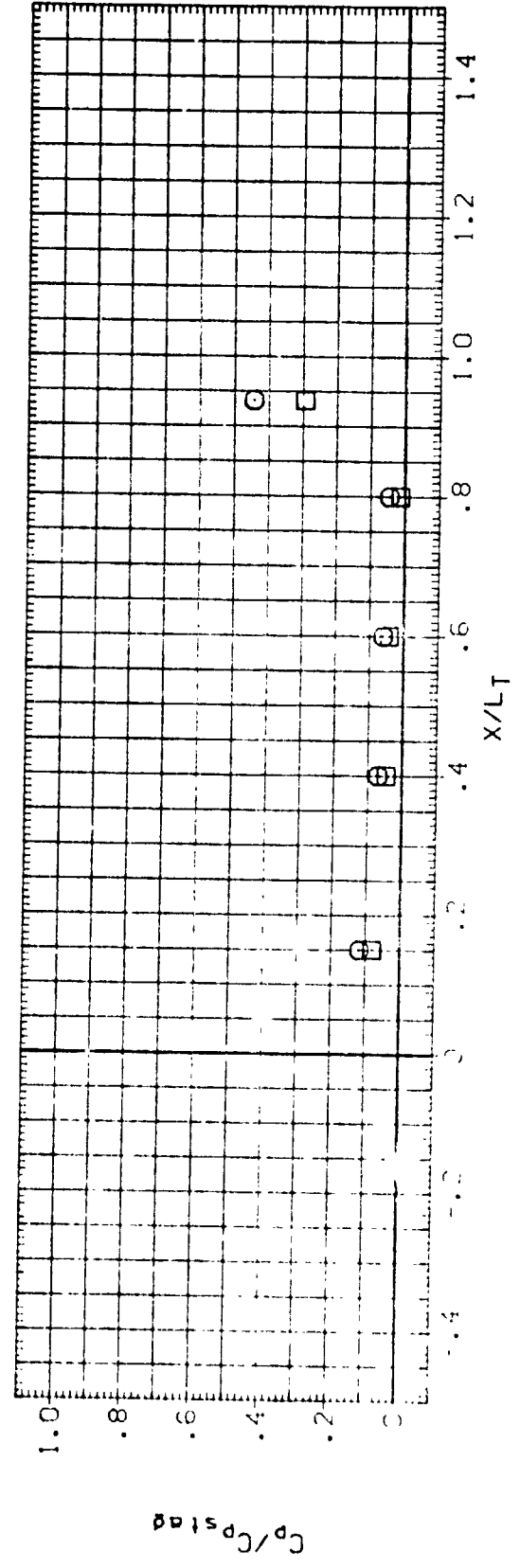
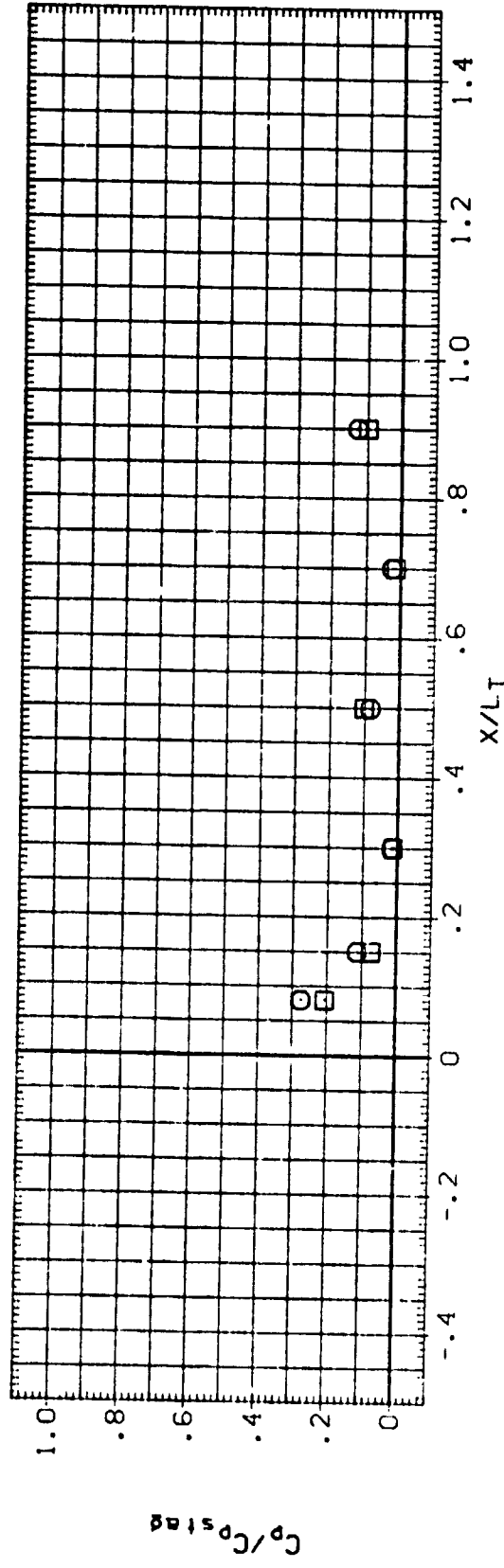


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA
-5.000
.000

X/LT MACH
.350 3.700
.300

PARAMETRIC VALUES
RN/L BETA
3.000 5.000

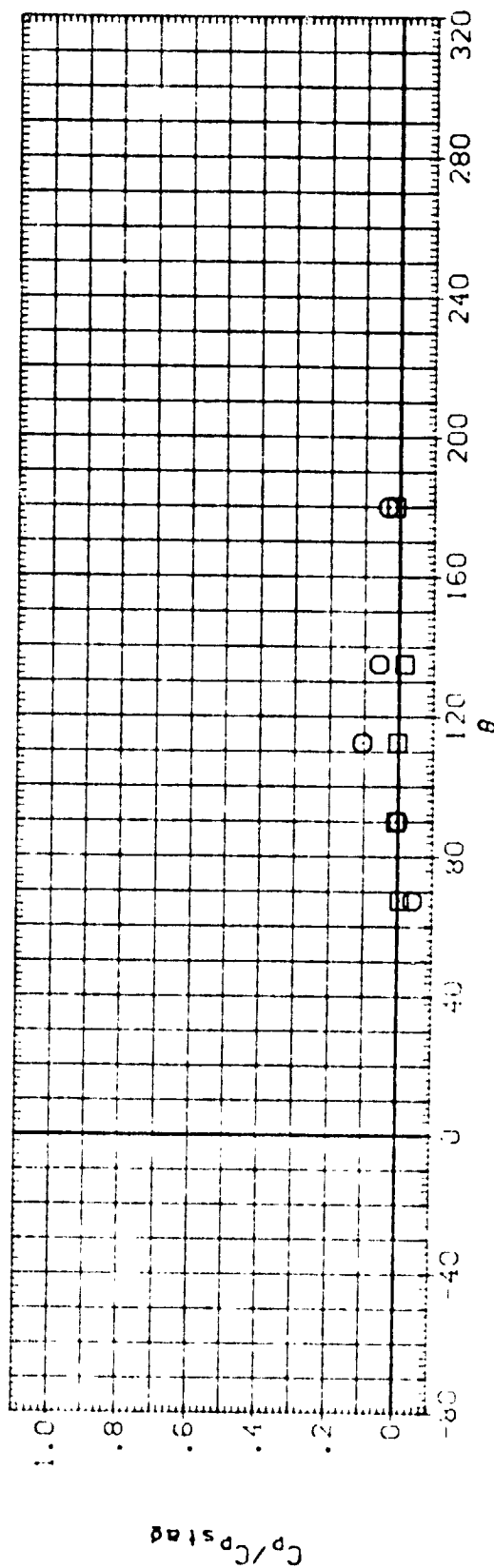
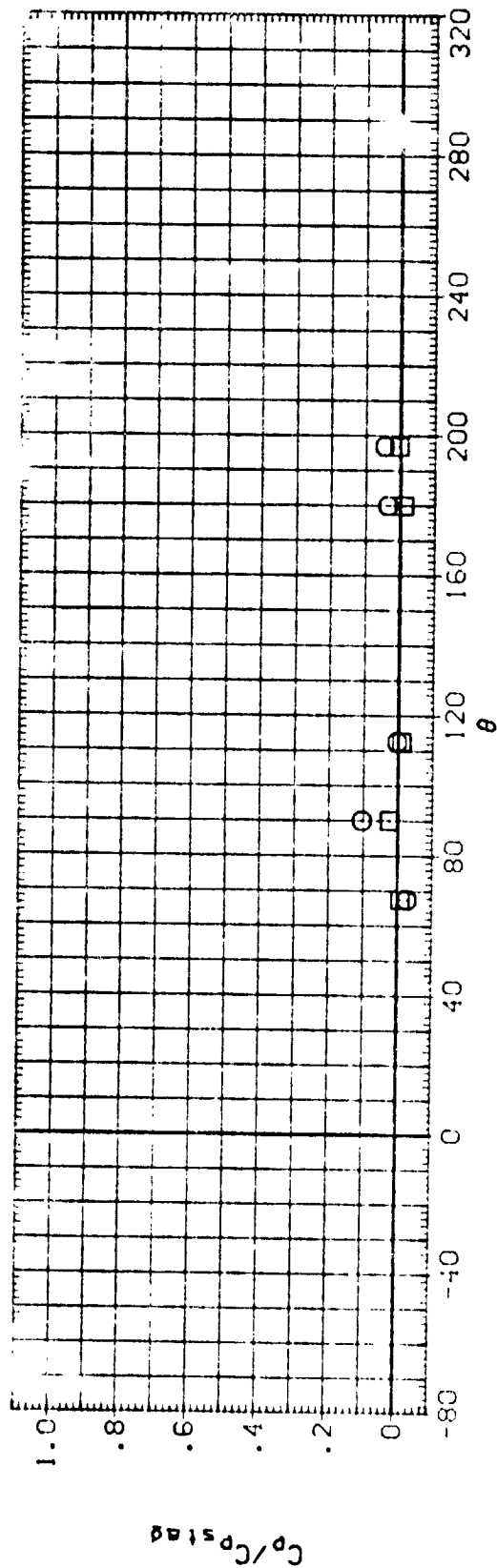


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

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(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA 5.000

RN/L

MACH

3.700

X/LT

.500

ALPHA

-5.000

SYMBOL

□

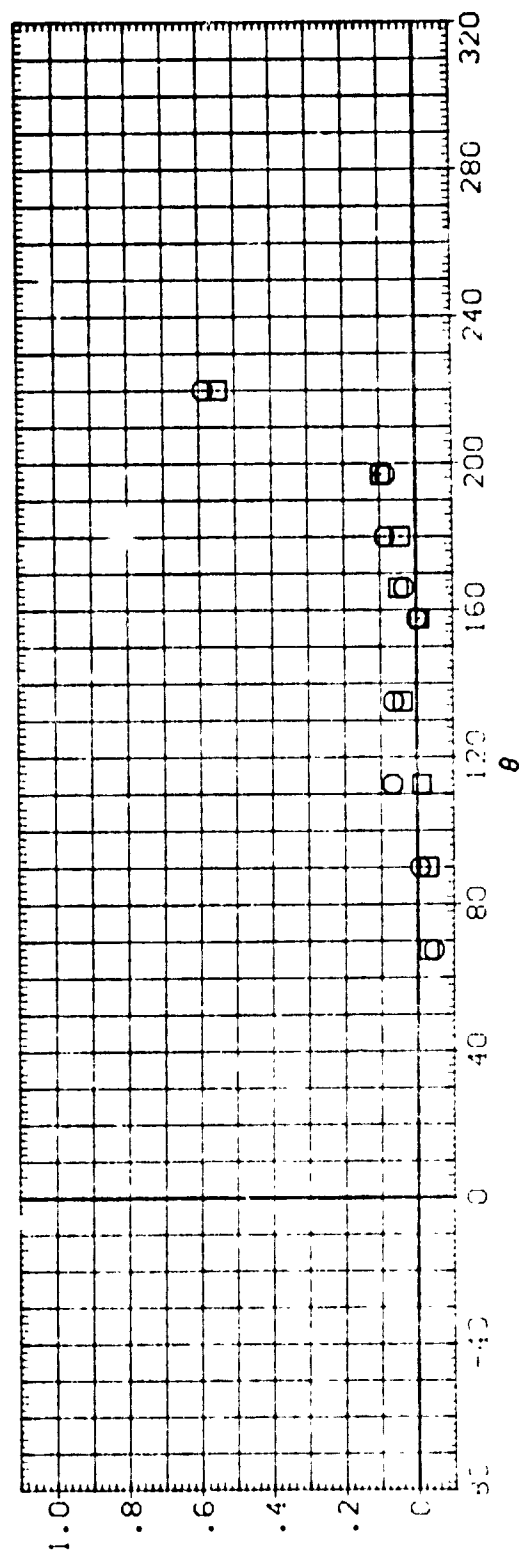
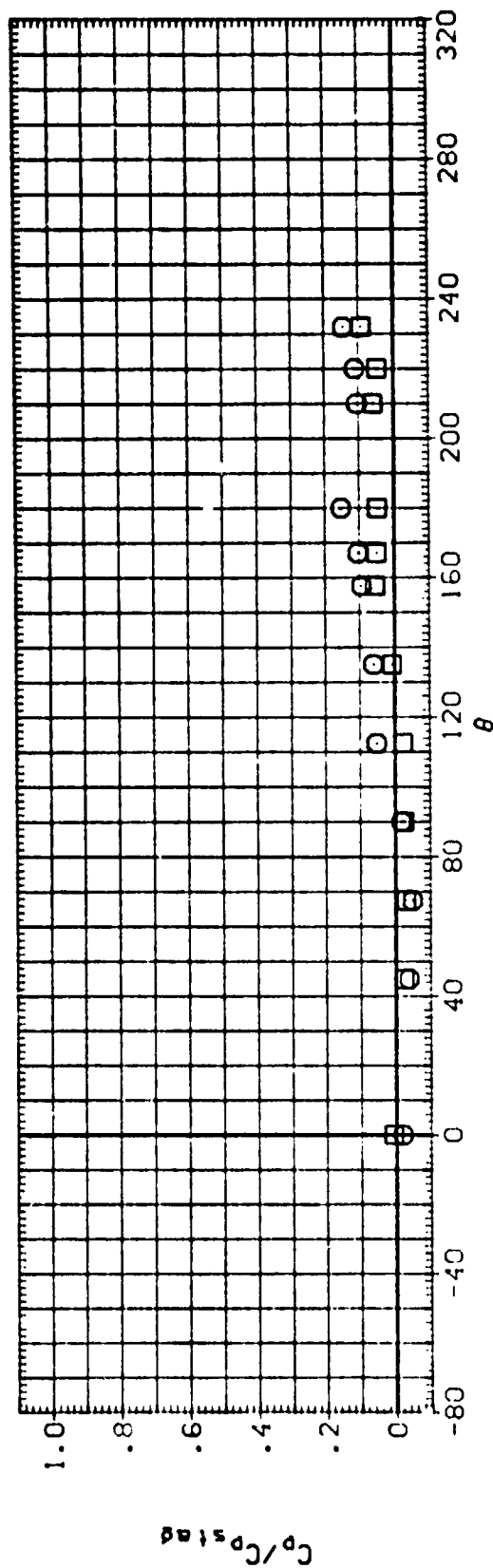


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK
 SY-BOL ALPHA X/LT MACH
 -5.000 3.700
 .00C .550

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

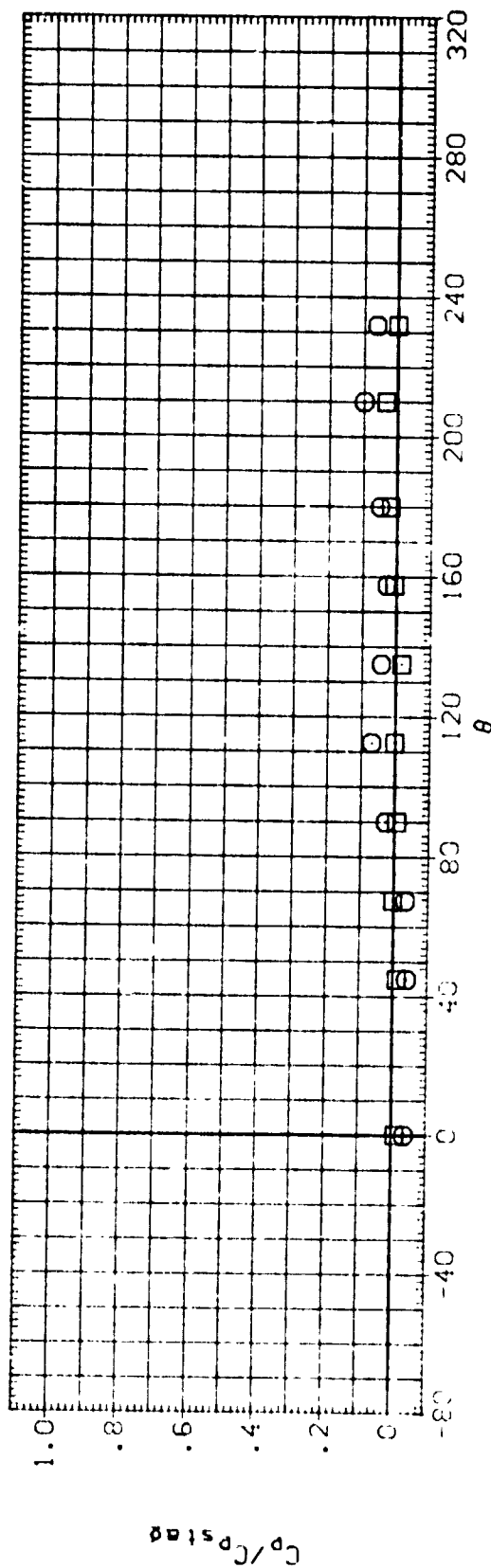
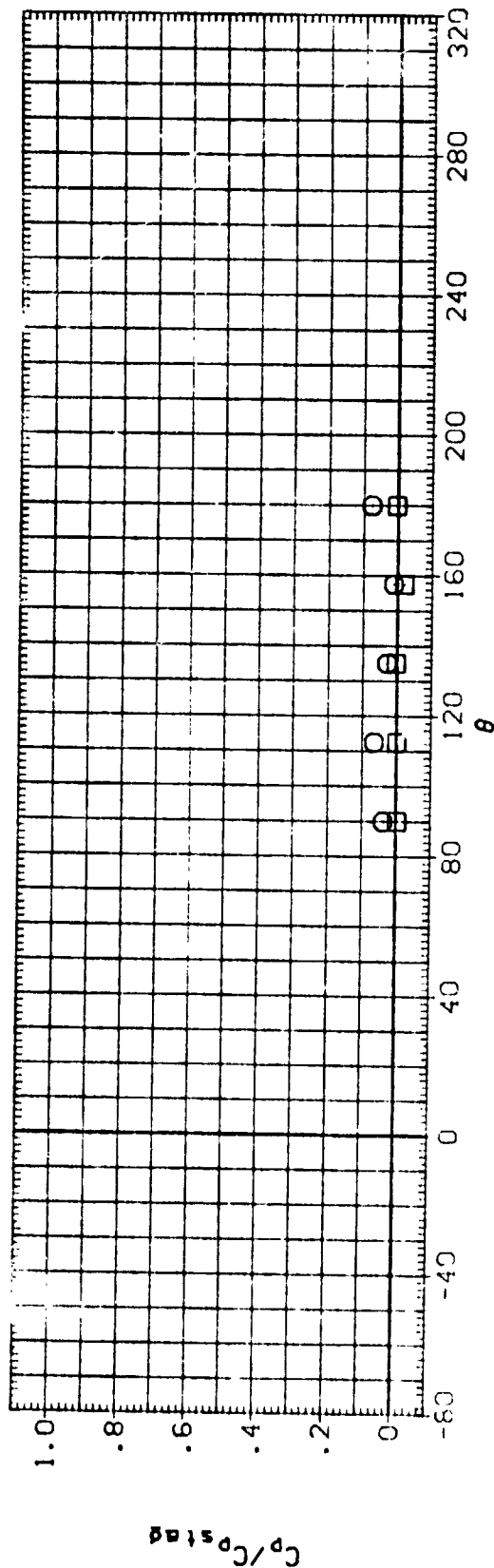


FIG. 32 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 5. RN/L = 3.0

(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA
5 -5.000

X/LT .700
.650

MACH 3.700

RN/L

PARAMETRIC VALUES
3.000 BETA

5.000

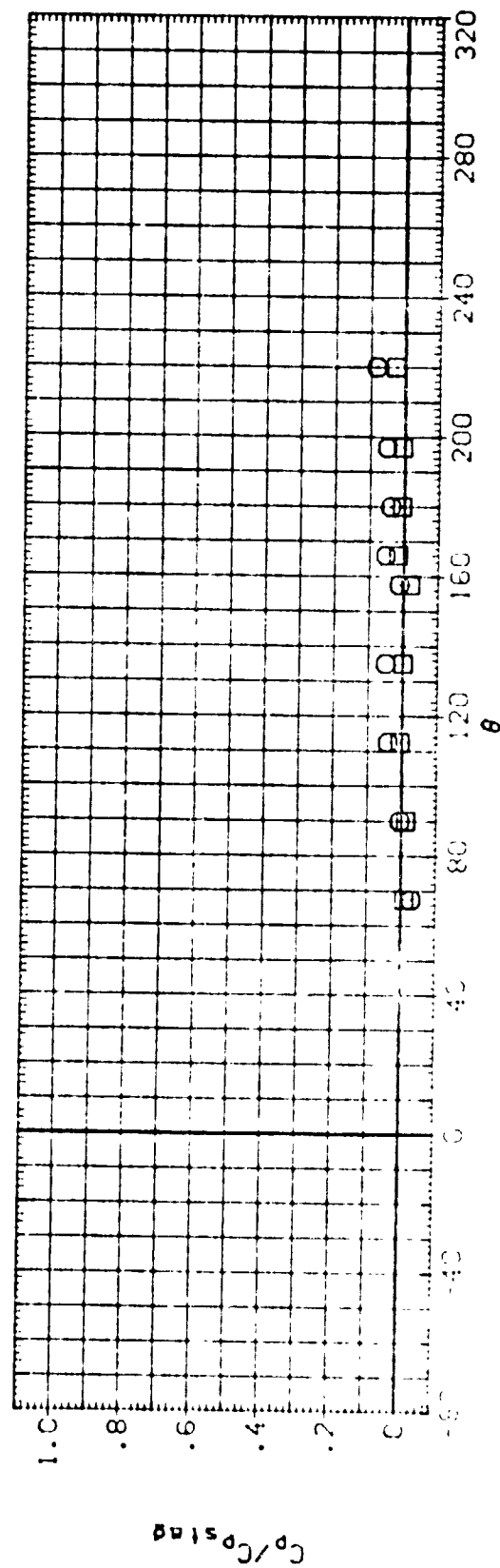
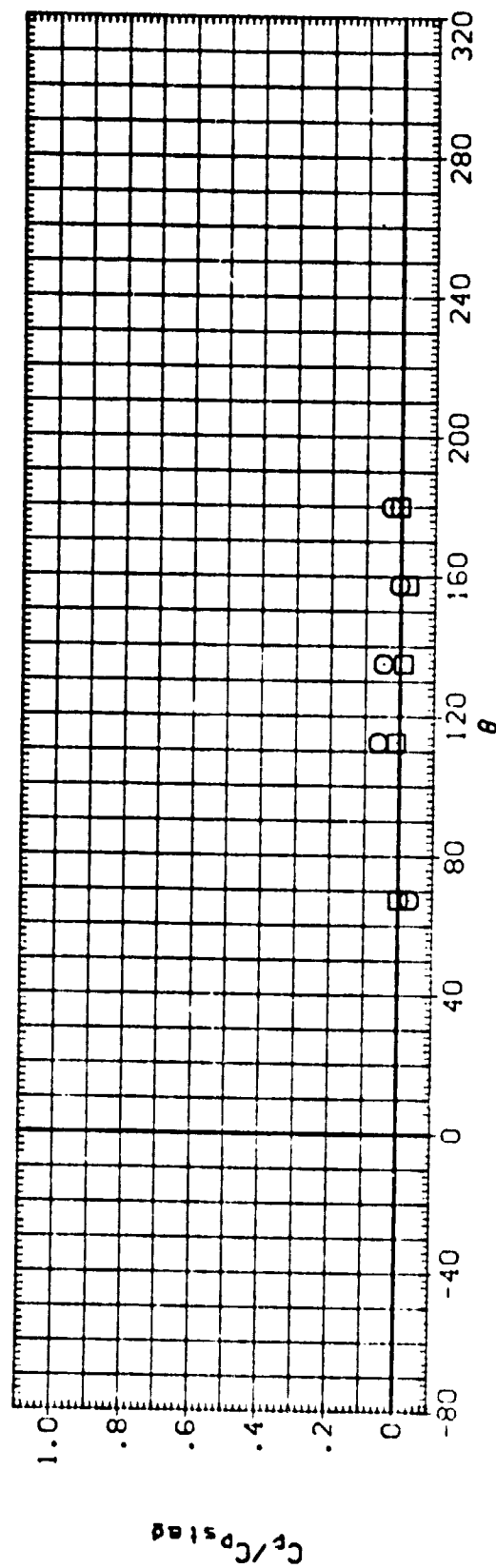


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

(RQ3TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYNCL ALPHA X/LT MACH 3.700
 -5.000 .750
 .000
 PARAMETER VALUES
 3.000 BETA 5.000
 RN/L

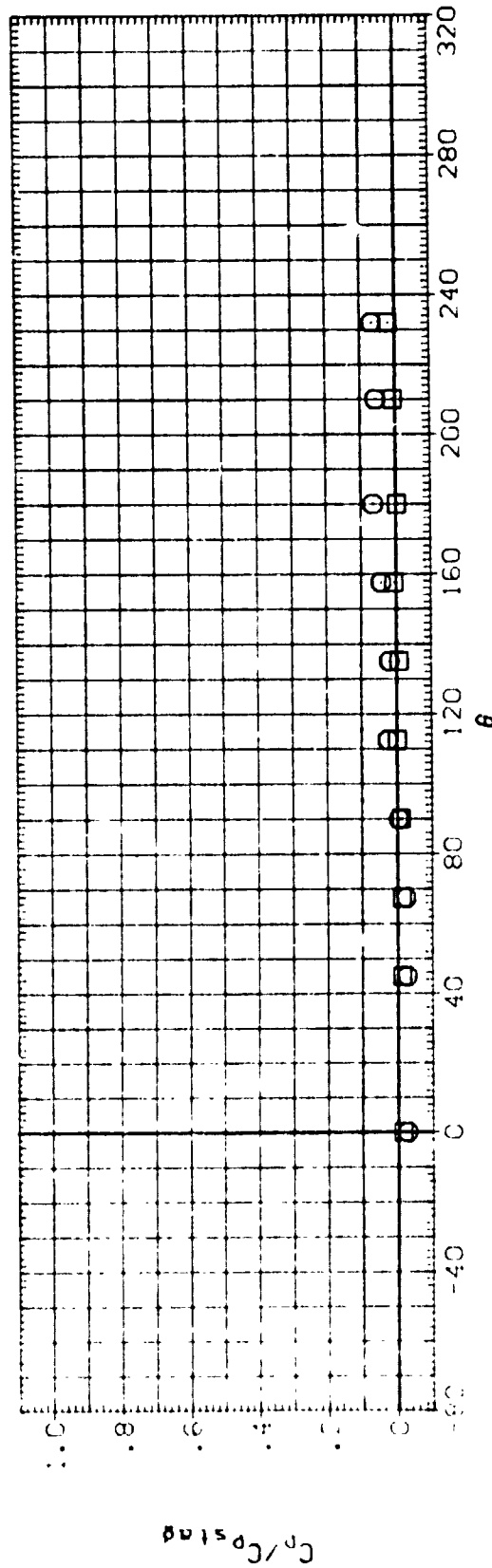
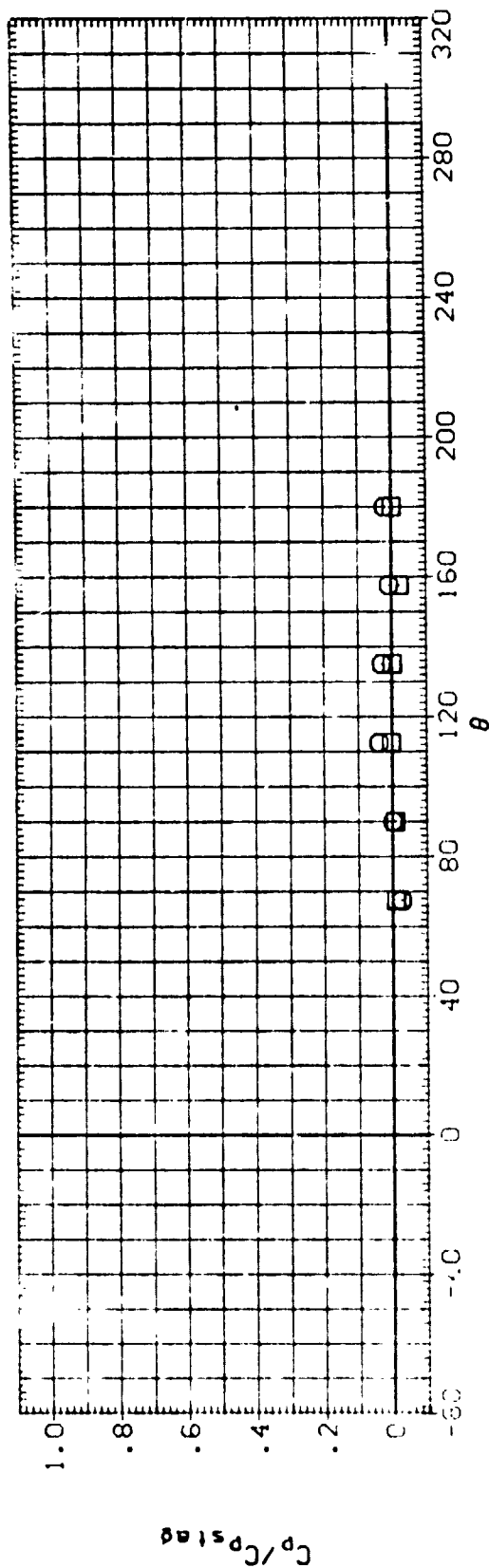


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

[R03TAE] UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -5.000 .900 3.700
 .000 .850

PARAMETRIC VALUES
 3.000 BETA 5.000
 RN/L

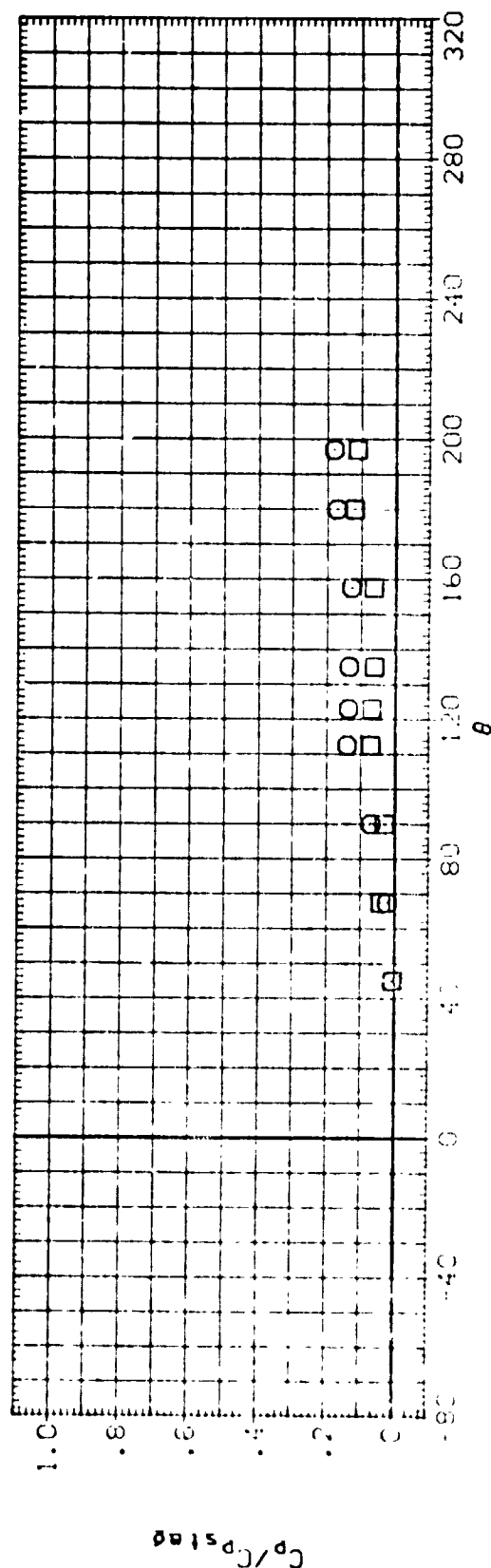
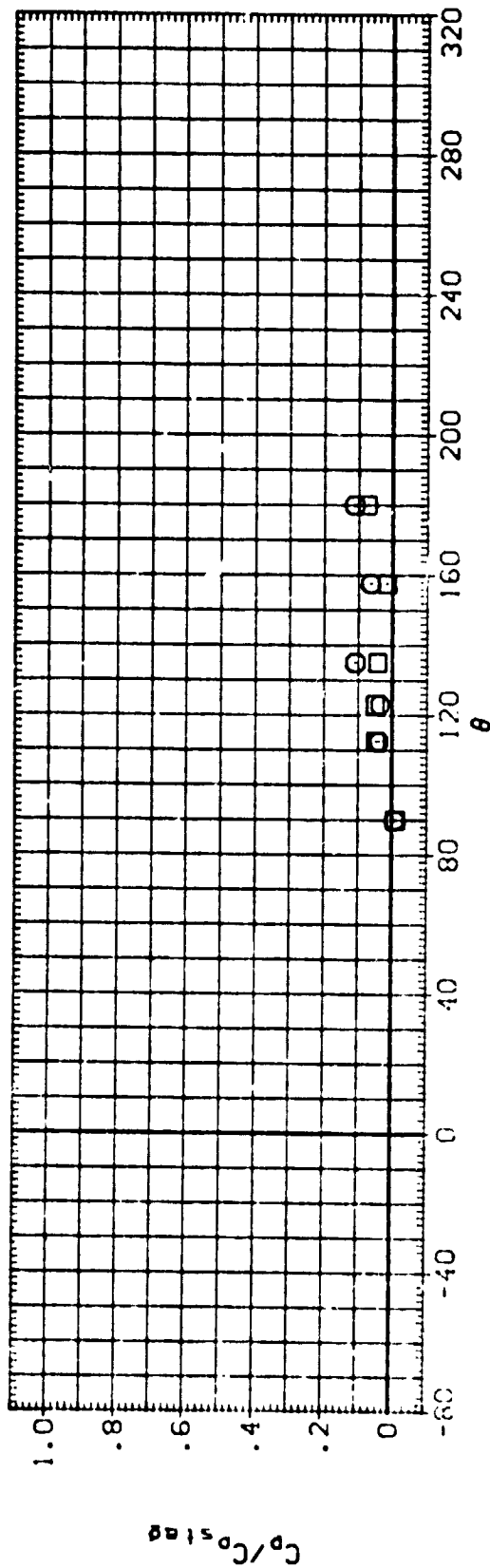


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 3.0. RN/L = 3.0

(R03TAE) UPWT 1059 (IH4) 01-T15-S9N16 EXTERNAL TANK

5-VEEL ALPHA
-5.000
.000

M/LT
.350
.300

MACH
4.600

RN/L

PARAMETRIC VALUES
3.000 BET.

5 00

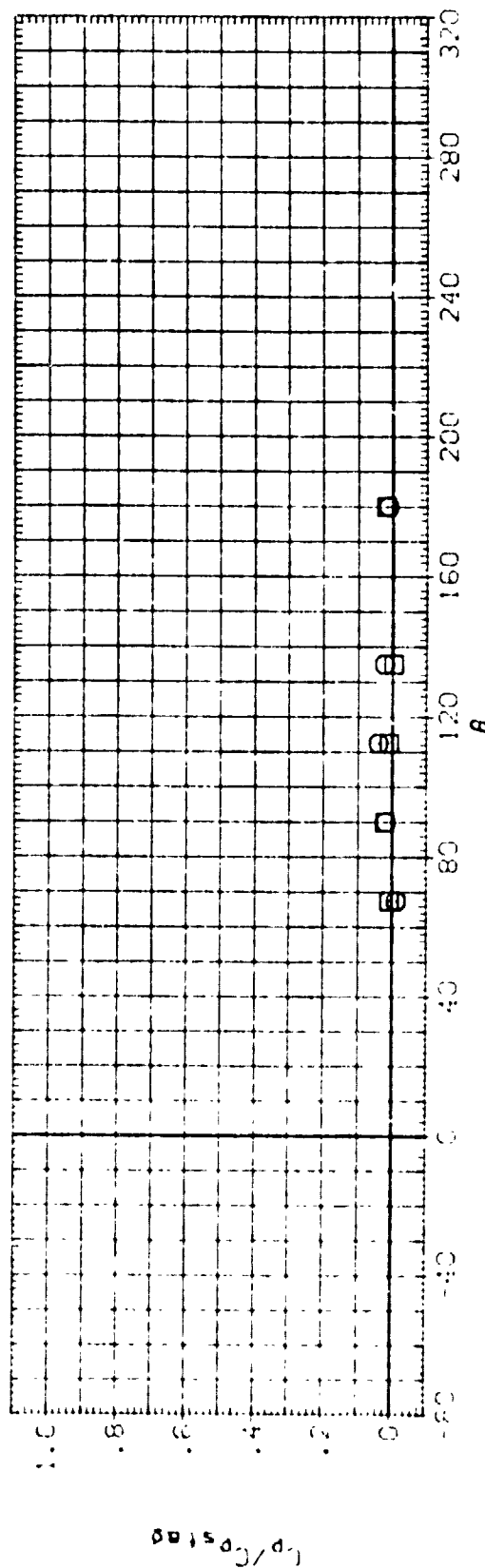
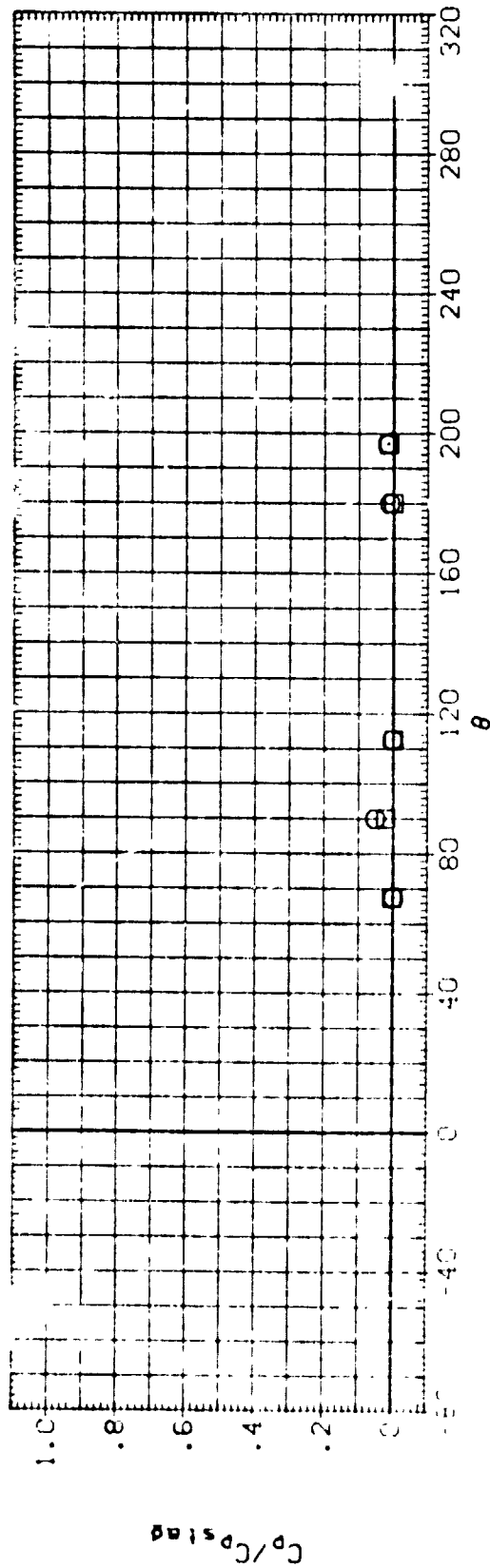


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

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(PQ3TAE) UPWT 1059 (IH4) 01-115-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA 5.000

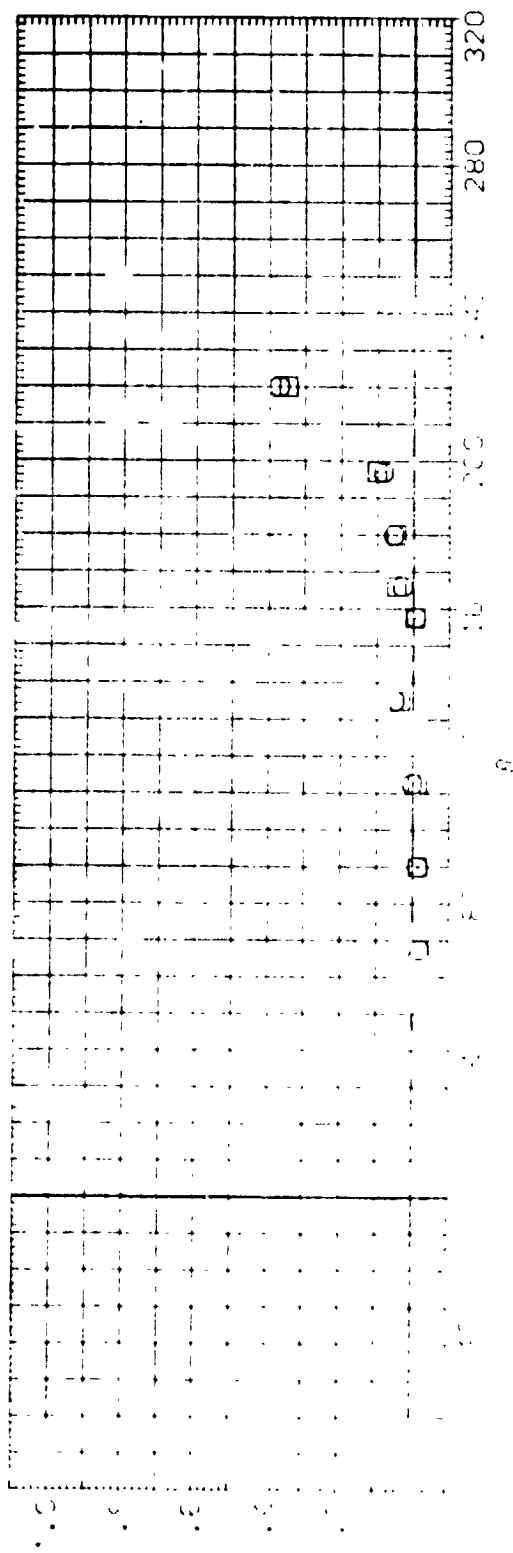
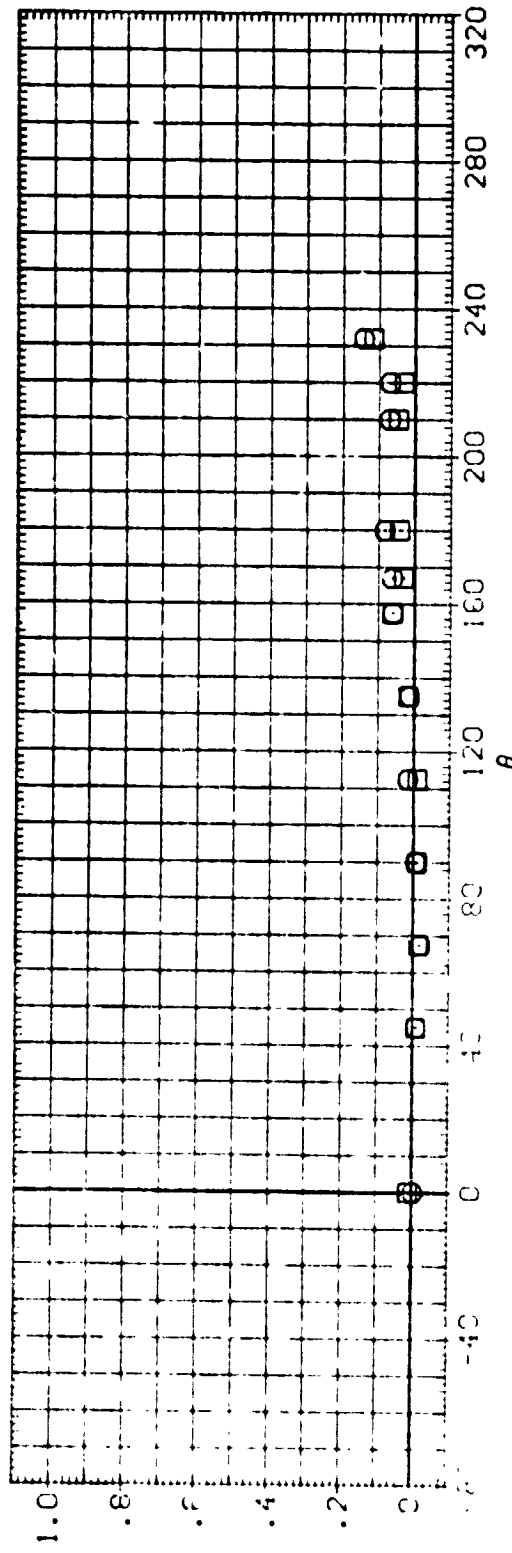
RN/L

MACH 4.600

ALFA 1.000

ALFA 1.000

ALFA 1.000



(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA
-5.000
.000

X/LT MACH
-600 4.607
.550

PARAMETRIC VALUES
RN/L BETA
3.000 3.000

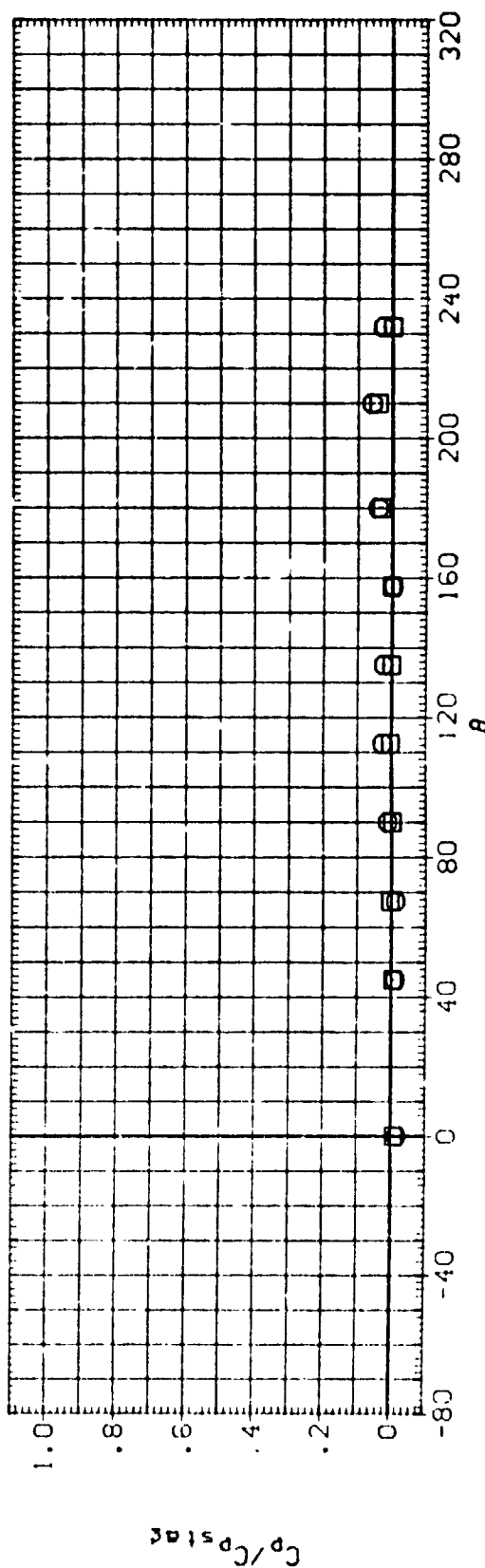
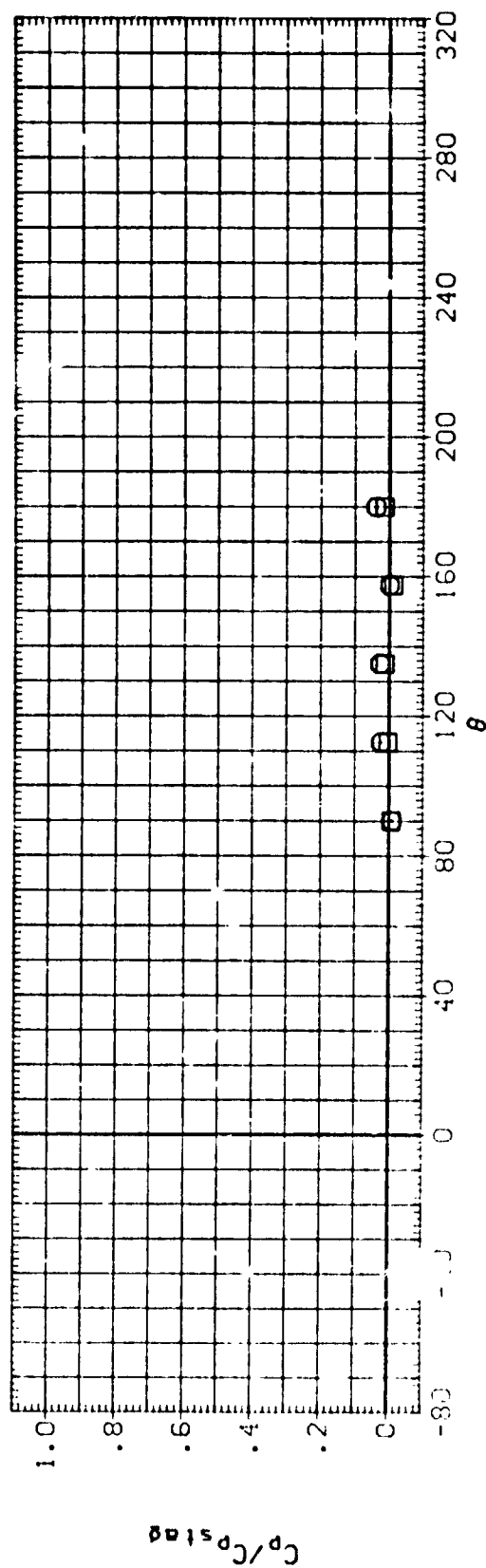


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

(RQ3TAE) USWT 1059 (IH4) -T15-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
 3.000 BETA 5.000

RN/L

SV480L
 ALPHA
 -5.000
 .000
 .700
 .650
 MACH
 4.600

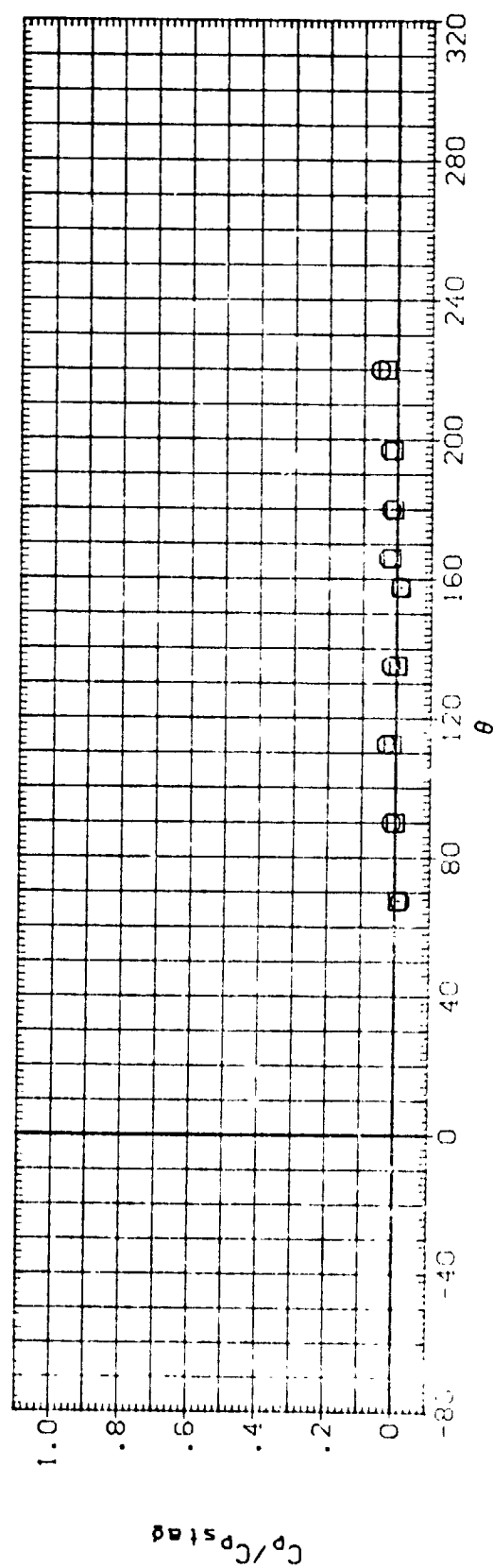
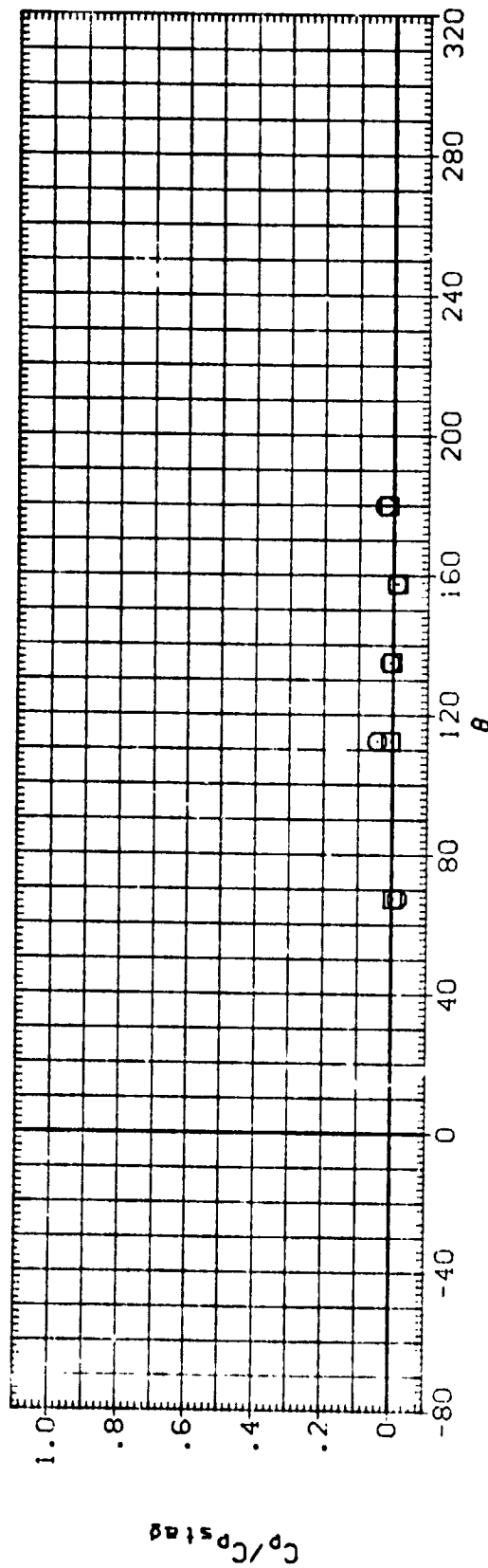


FIG. 32 VARIATION OF C_p/C_{pstag} ON THE INTEGRATED VEHICLE WITH T15, EXTERNAL TANK, BETA= 5, $RN/L= 3.0$

(RQ3TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 □ -5.000 .800 4.600
 □ .000 .750

PAI / ETIC VALUES
 3.00 BETA 5.00

RN/L

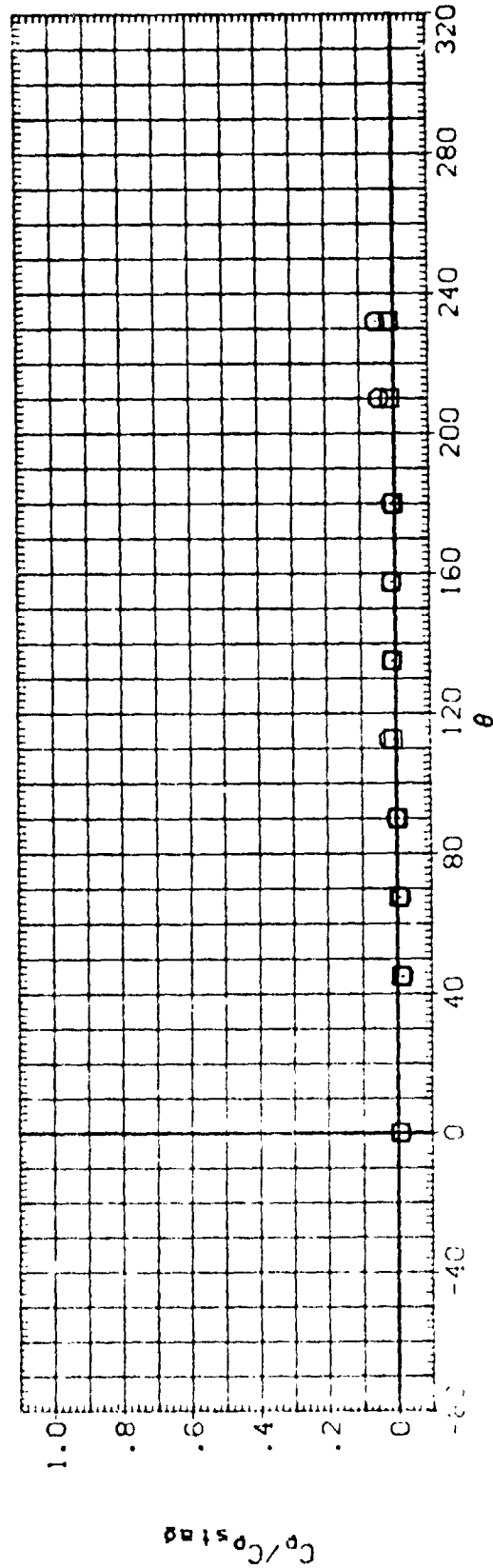
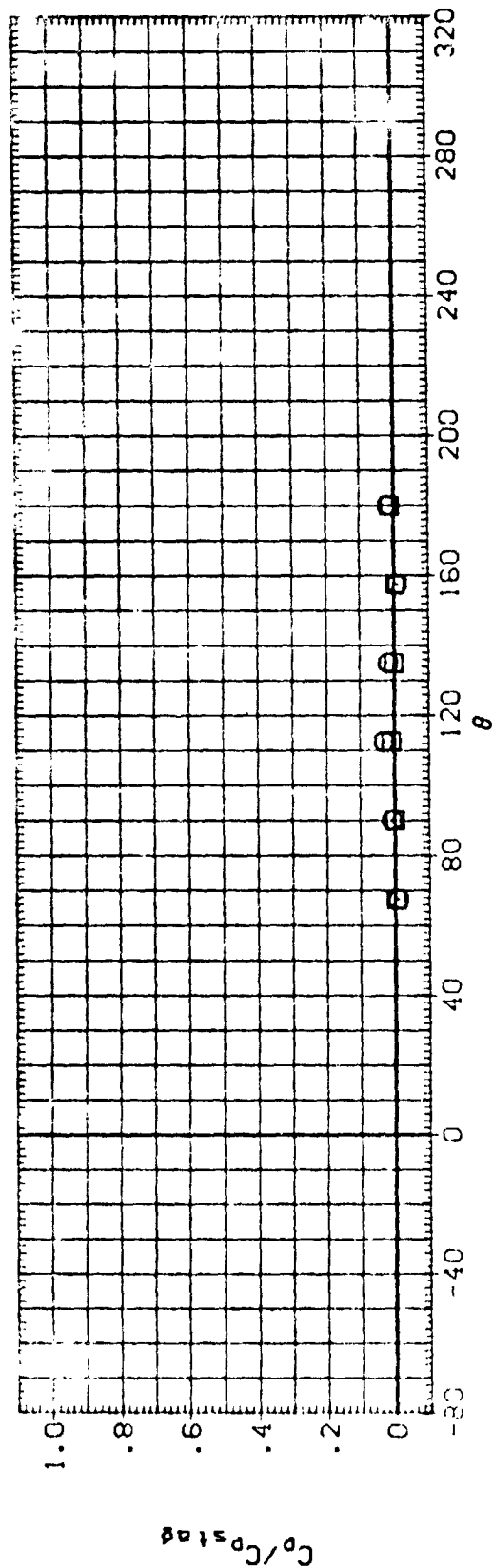


FIG. 32 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA= 5. RN/L= 3.0

(R03TAE) UPWT 1059 (IH4) 01-T15-S8N16 EXTERNAL TANK

SYMBOL

ALPHA

X/LT

MACH

-5.000

.900

4.600

.000

.850

RN/L

PARAMETRIC VALUES

3.000

BETA

5.000

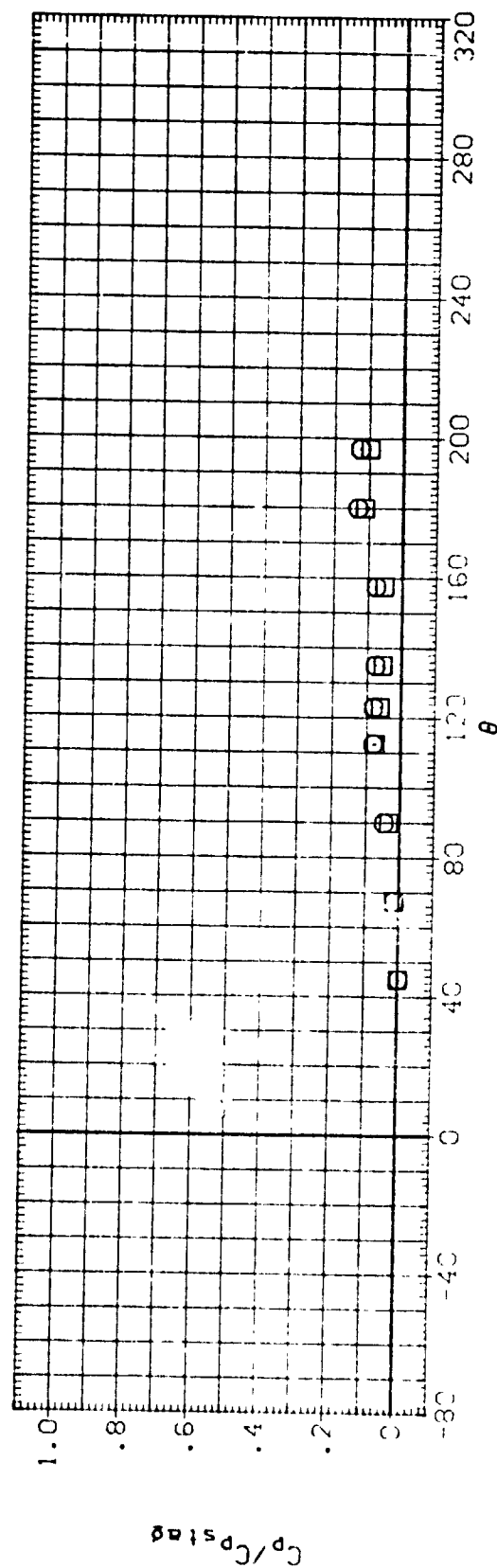
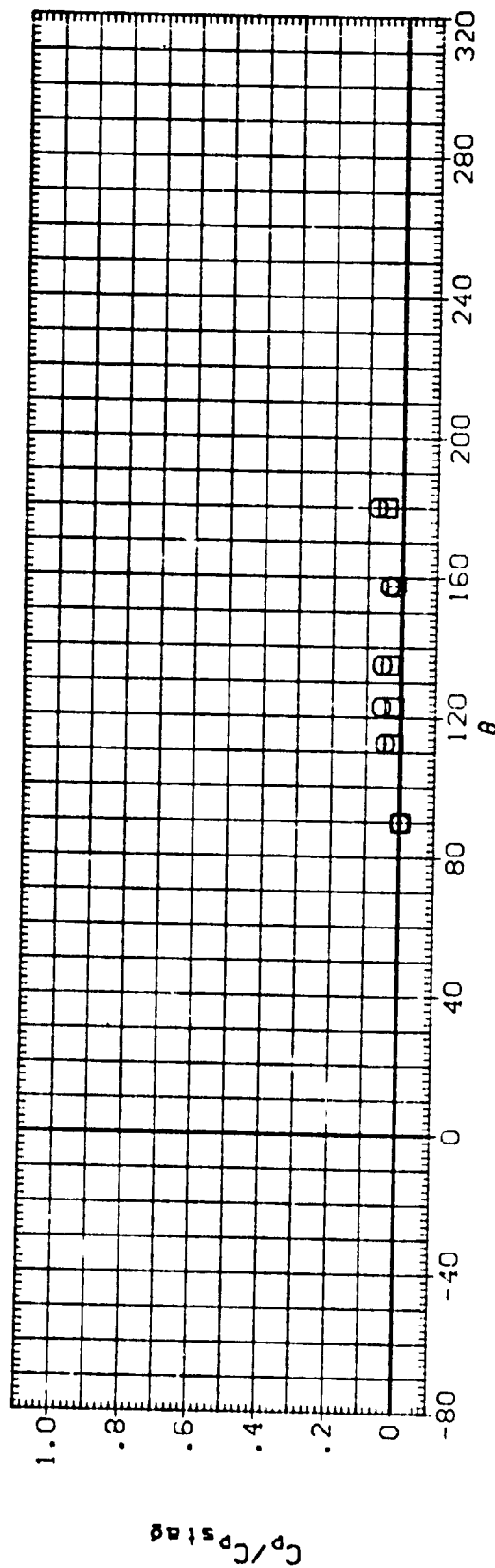


FIG. 32 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. EXTERNAL TANK. BETA = 5. RN/L = 3.0

(RQ3SAE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
-5.000 180.000 3.700
90.000

PARAMETRIC VALUES
RN/L 3.000 BETA 5.00

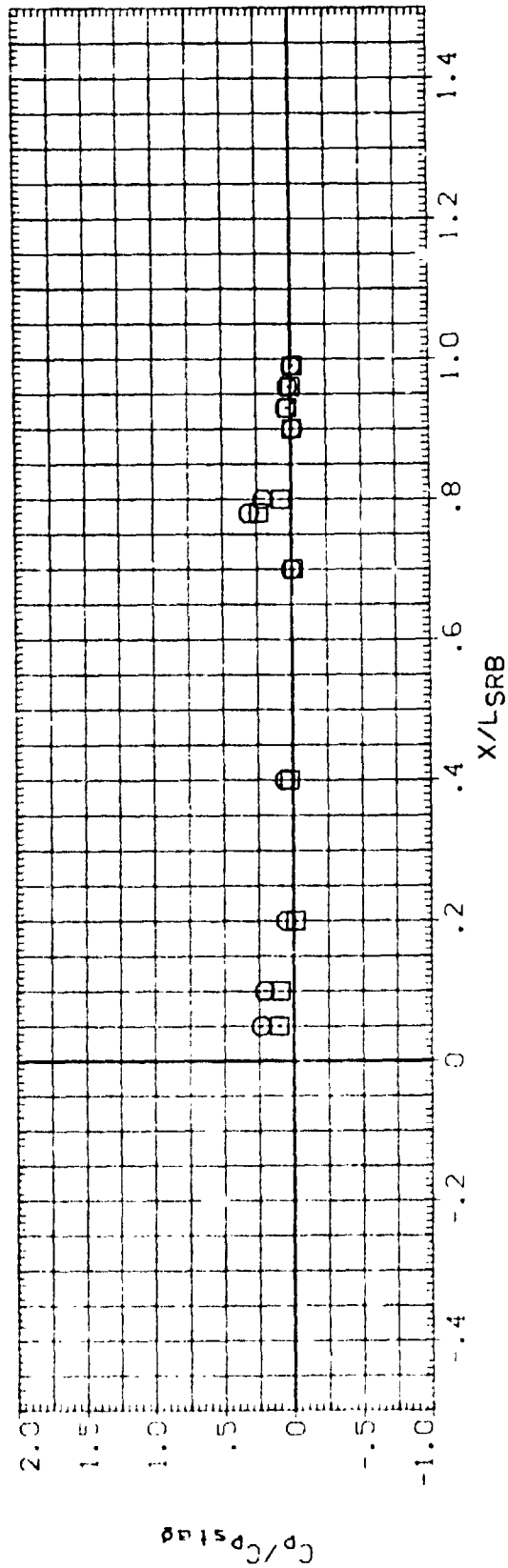
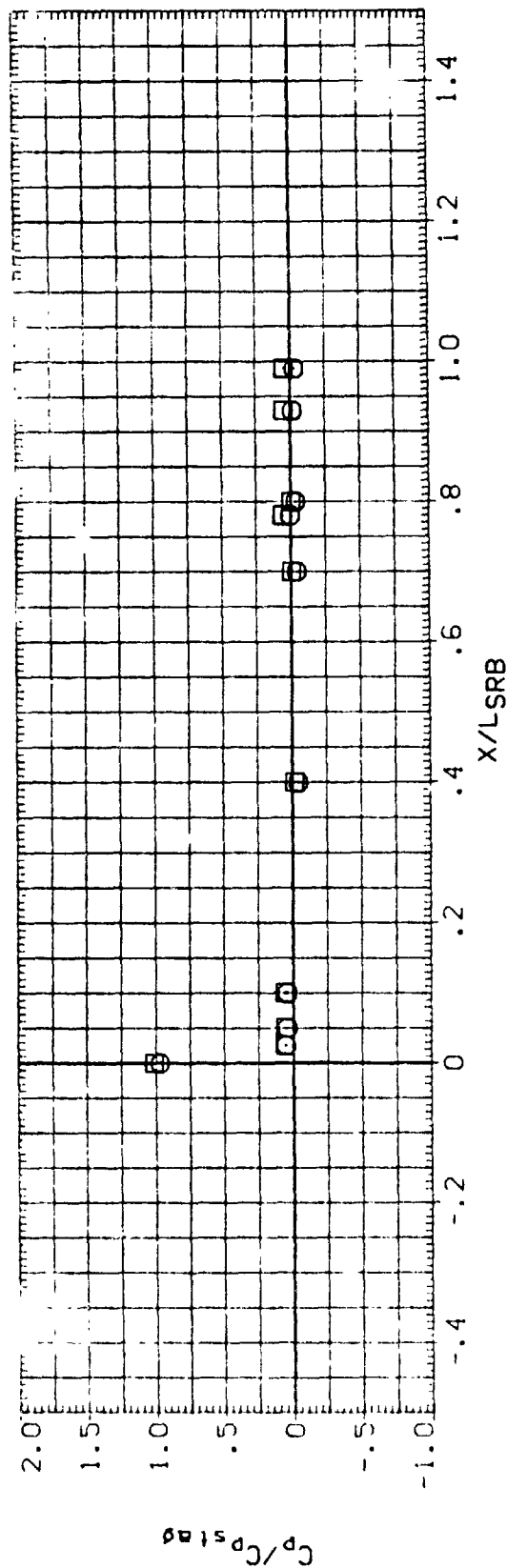


FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, BETA= 5, RN/L= 3.0

(R03SAE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	PSI	MACH	RN/L	PARAMETRIC VALUES
0	-5.000	225.000	3.700		3.000 BETA 5.000
	.000	210.000			

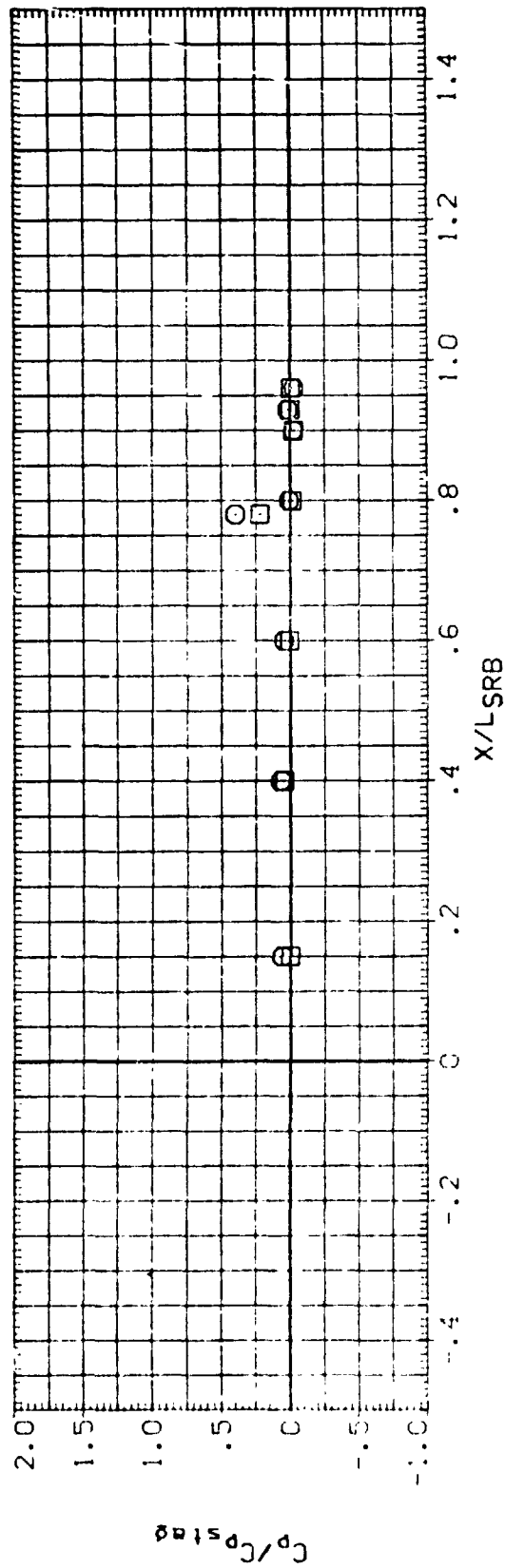
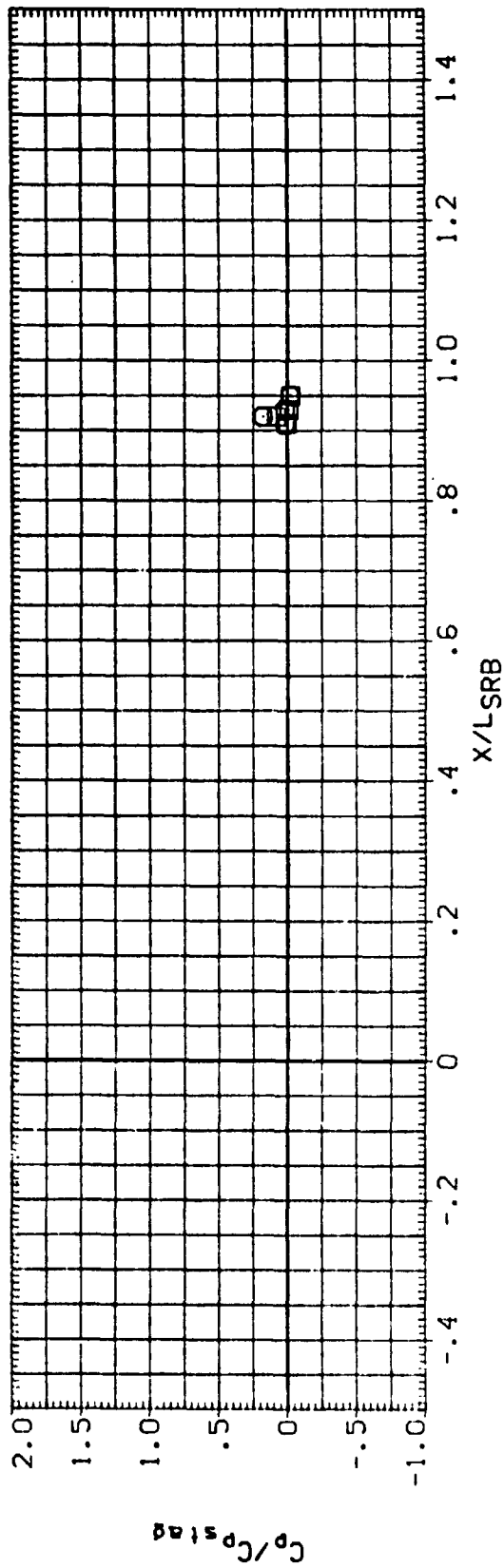


FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, BETA= 5. RN/L= 3.0 PAGE 393

(R03SAE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL \square ALPHA PSI 273,000
 -5.000 MACH 3.700
 .000 247,500

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

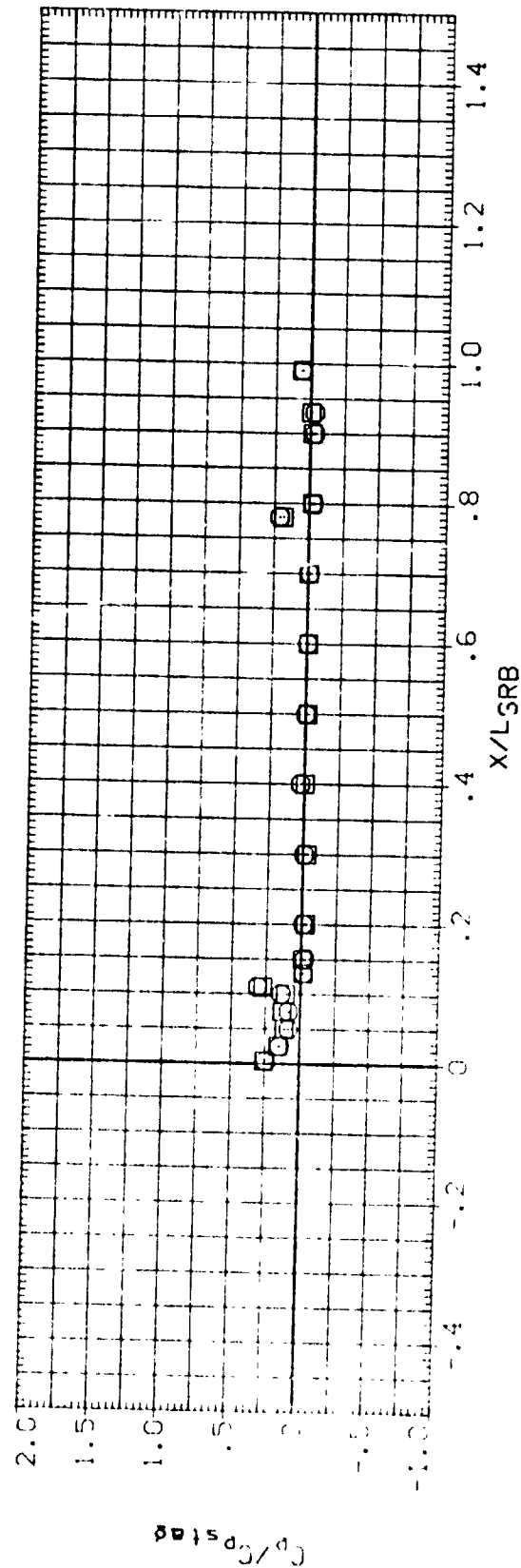
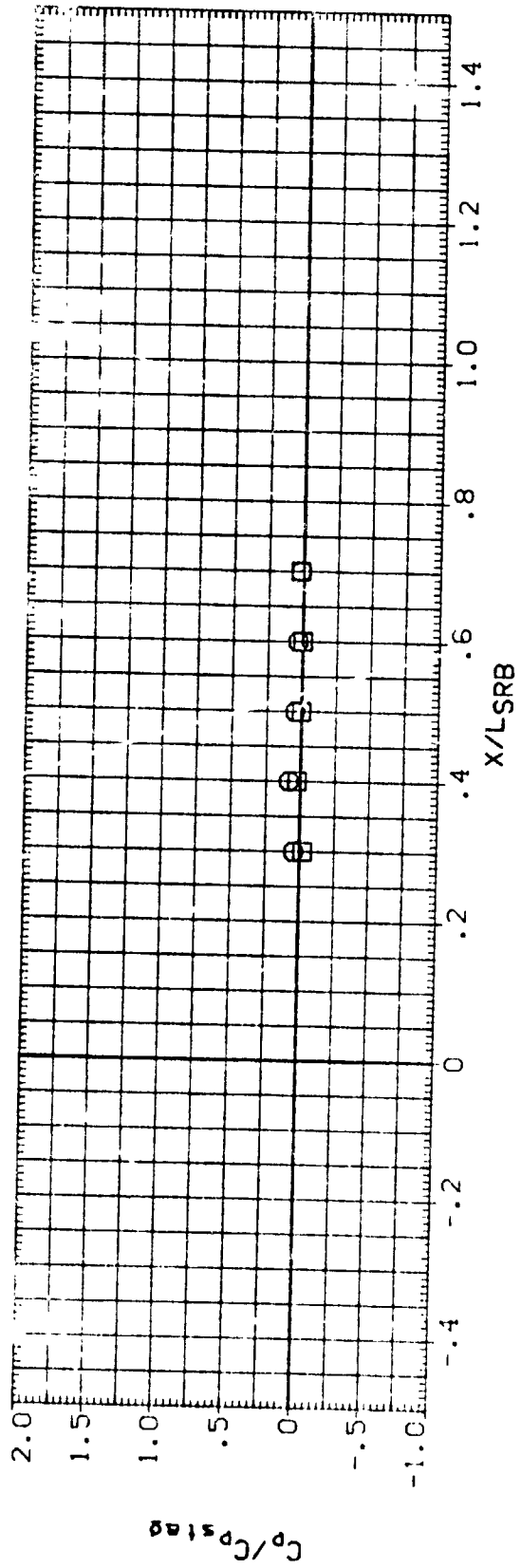


FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 5. RN/L= 3.0

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(RQ3SAE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PS: MACH
 -5.000 190.000 4.600
 .000 90.000

PARAMETRIC VALUES
 3.000 BETA 5.000
 RN/L

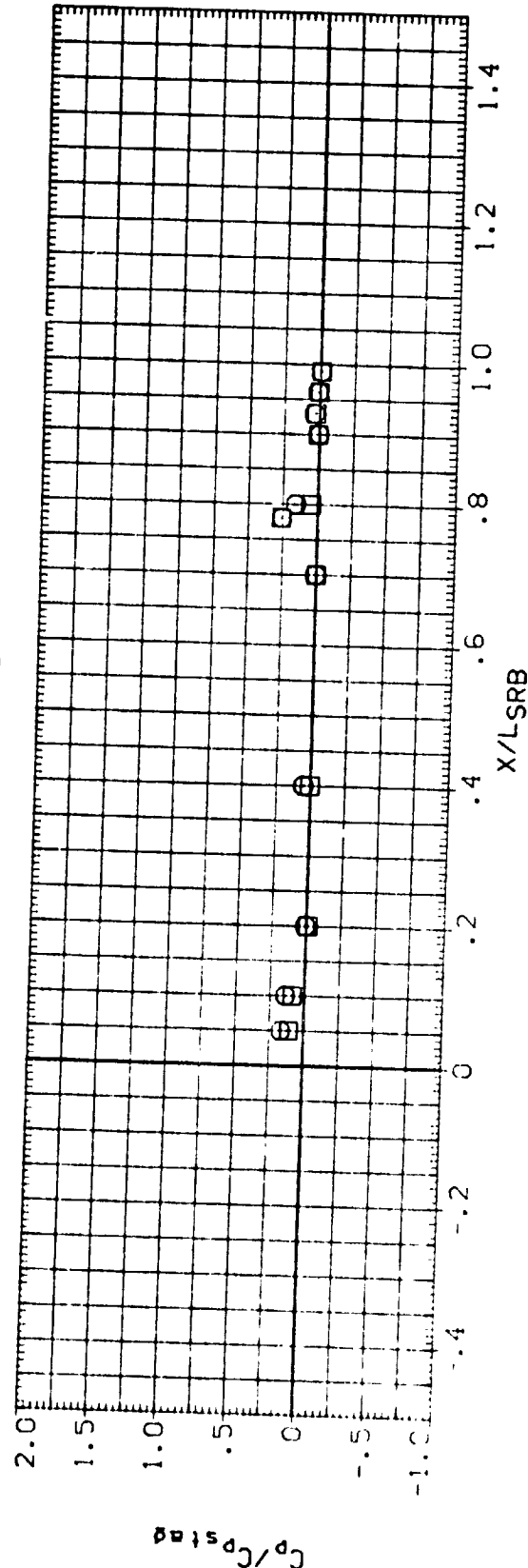
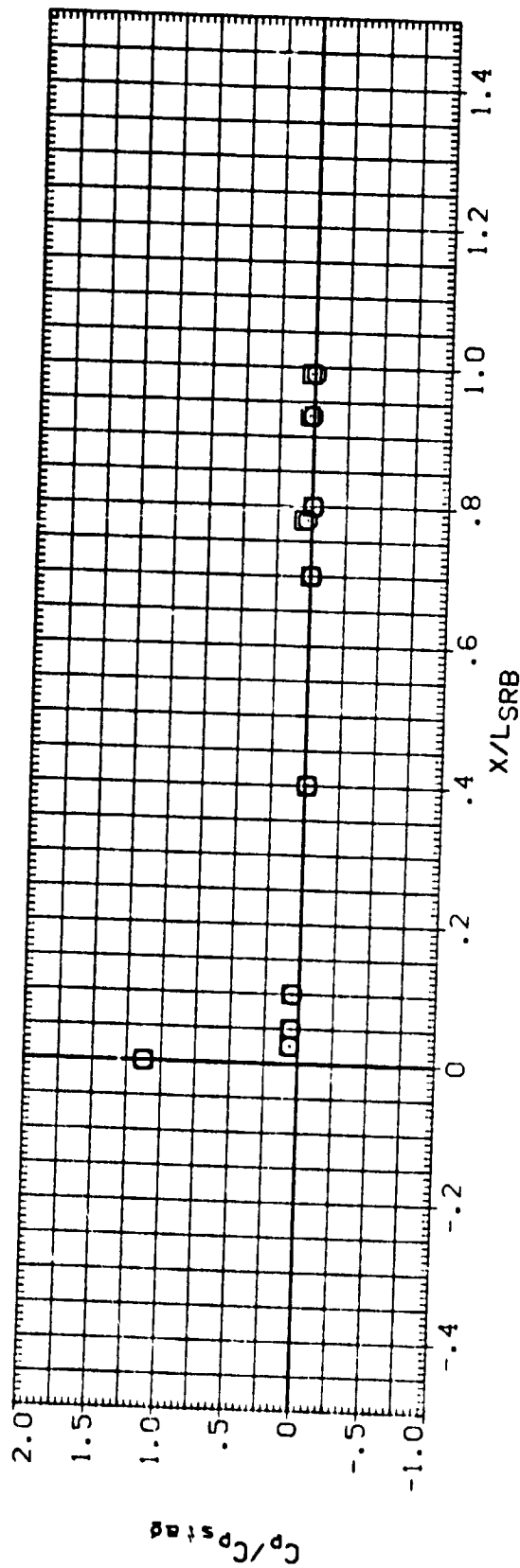


FIG. 33 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER. BETA= 5. RN/L= 3.0

(R03SAE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -5.000 225.000 4.600
 .000 215.000

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

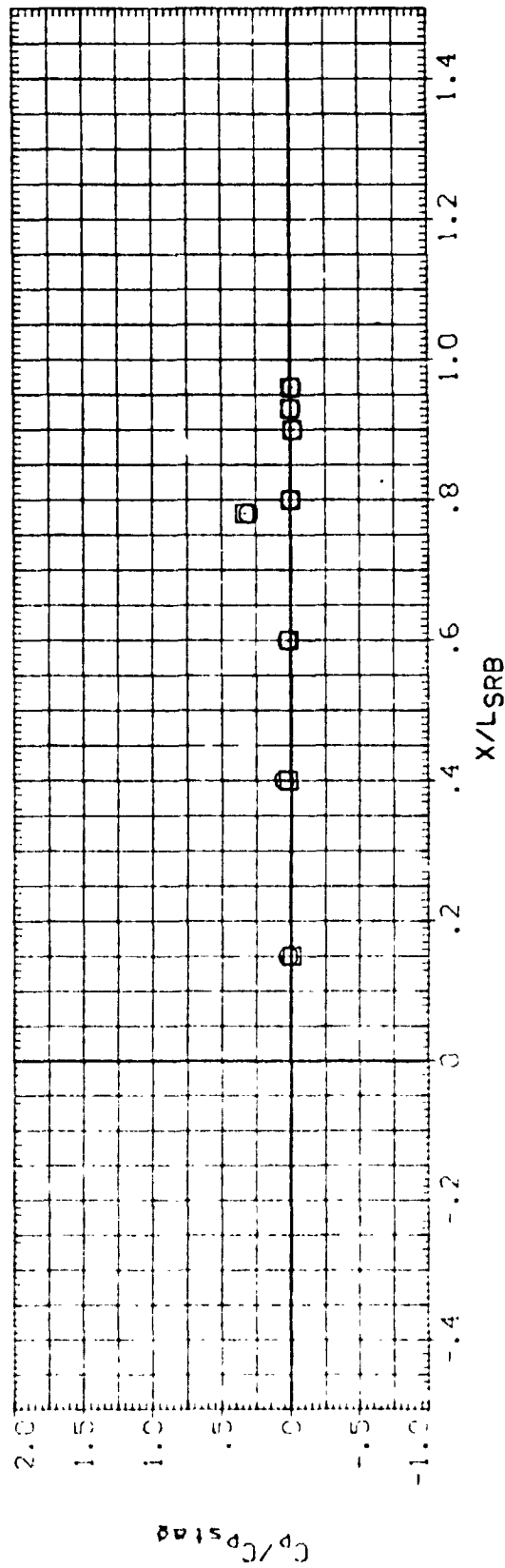
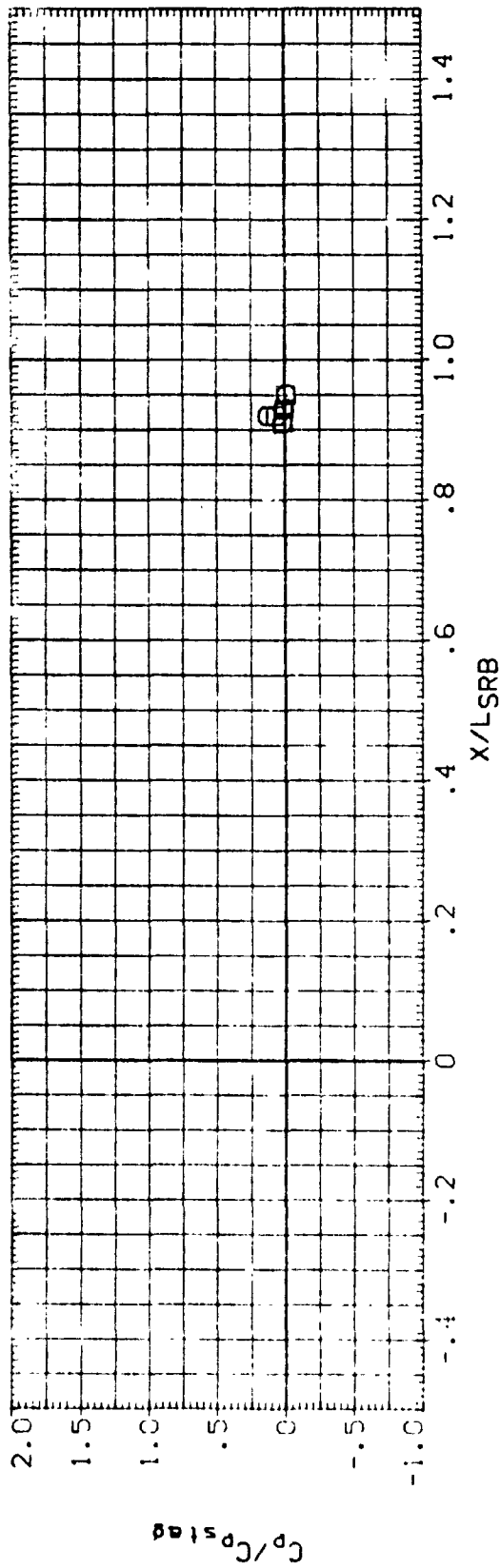


FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER. BETA= 5. RN/L= 3.0

(R03SAE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -5.000 270.000 4.600
 .000 247.500

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

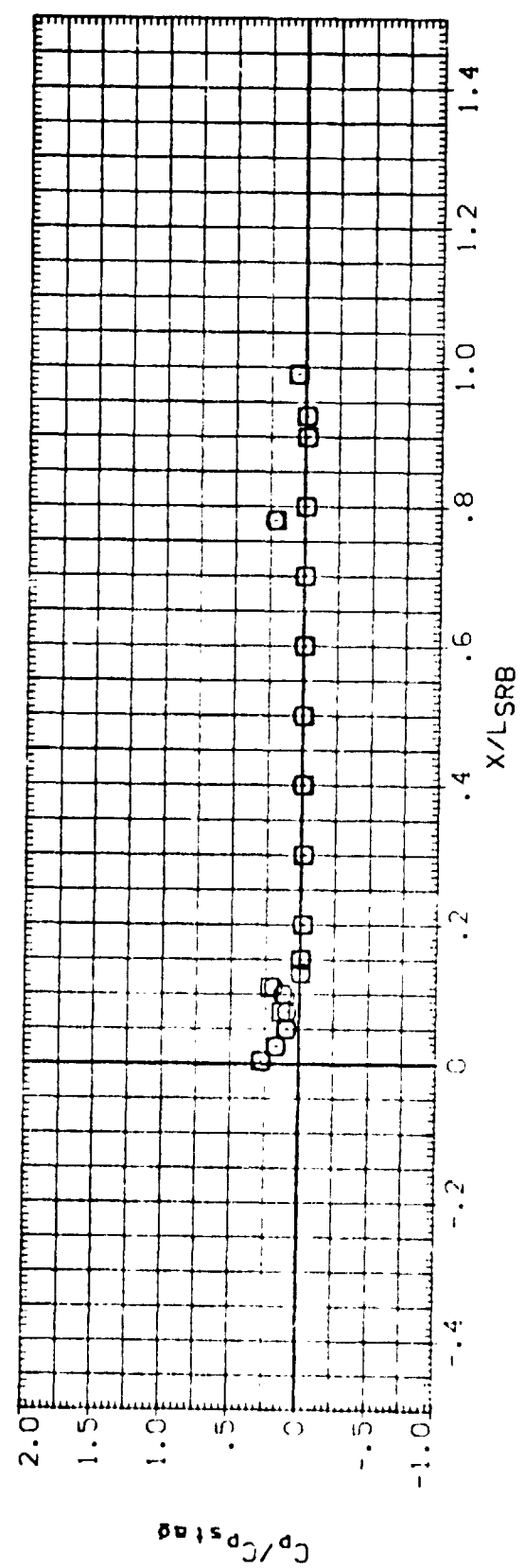
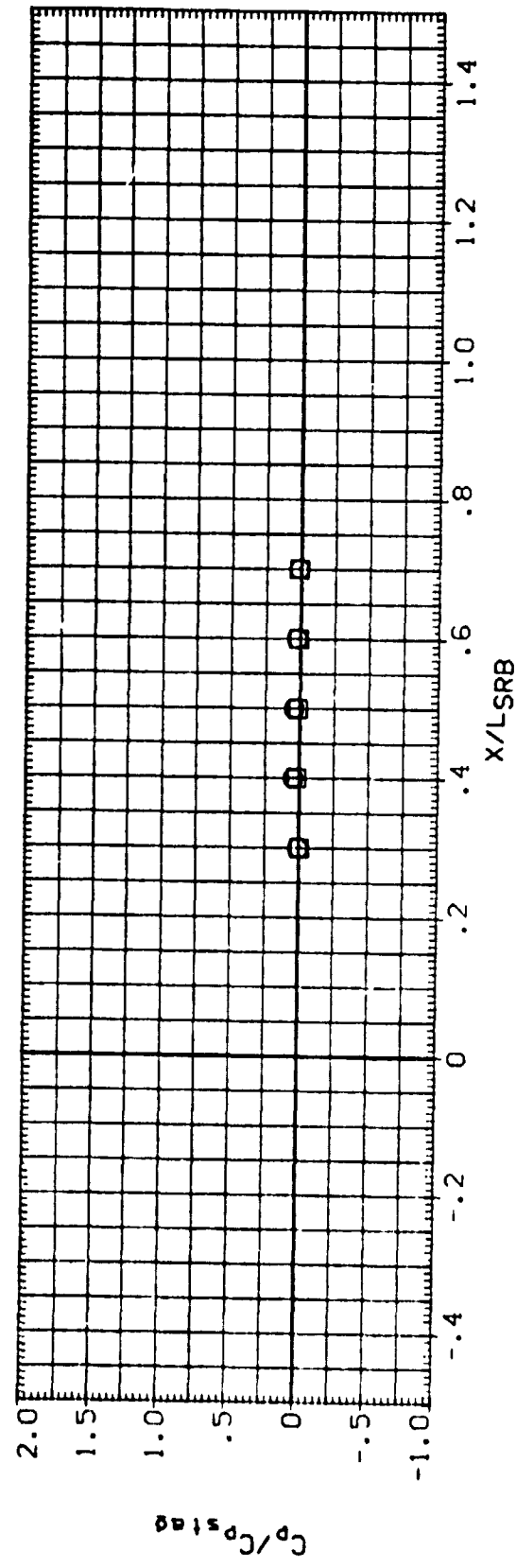


FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, BETA= 5, RN/L= 3.0

[RQ3SAE] JPWT 1059 (IH4) 01-T15-S9N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/L SRB MACH
 □ -5.000 .500 3.700

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

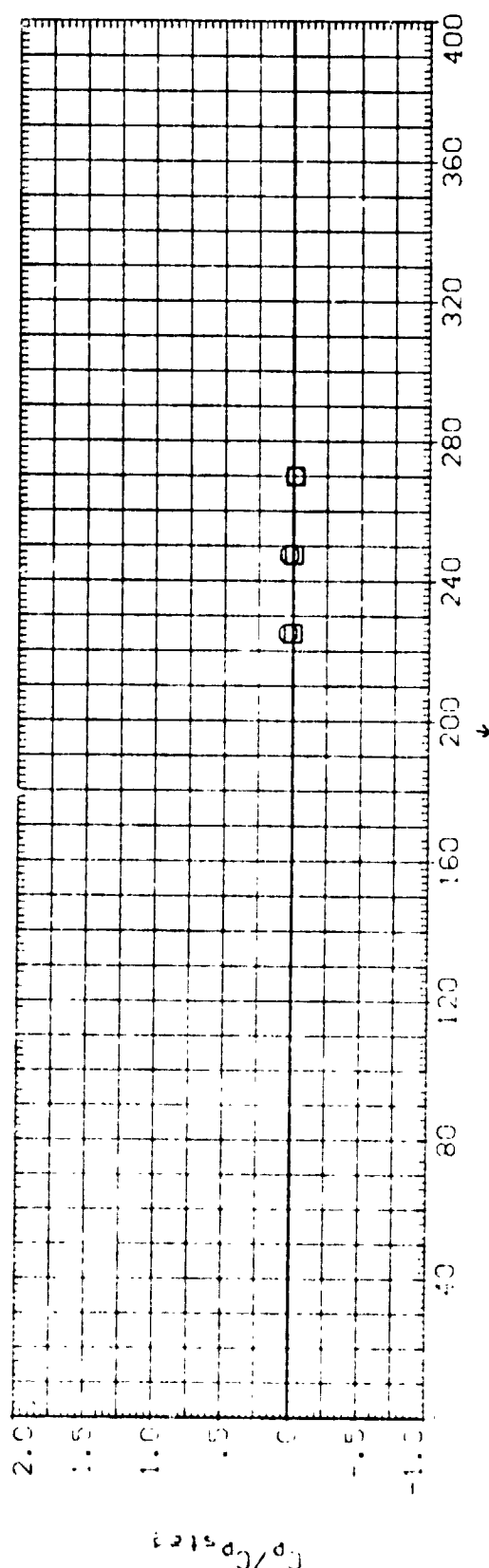
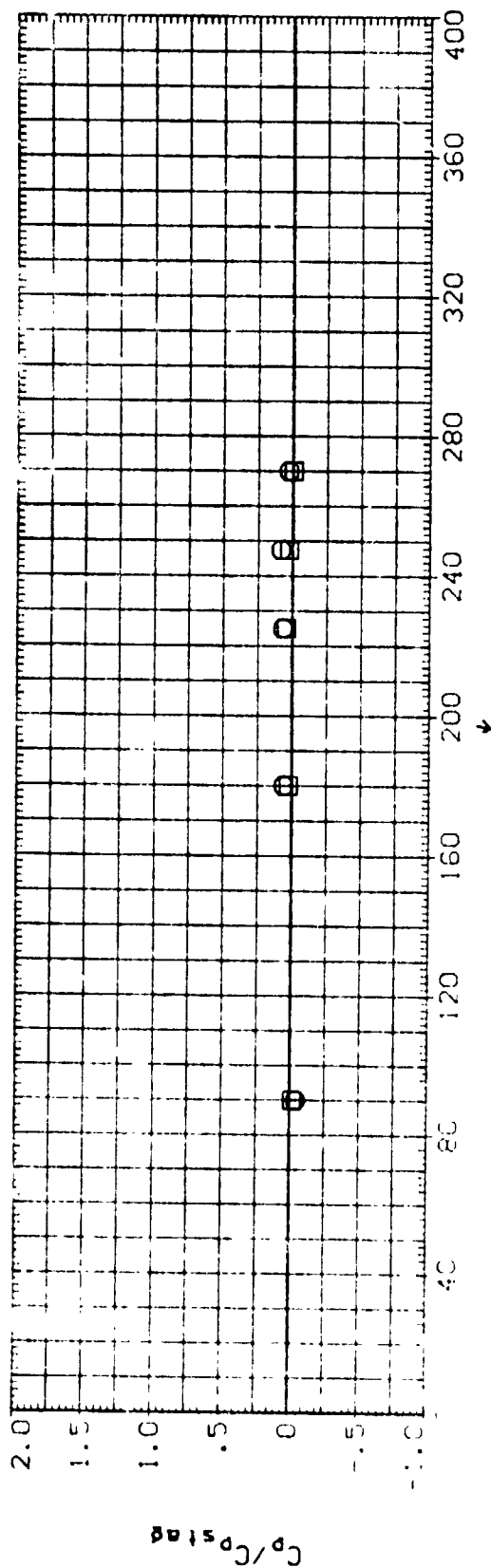


FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 5. RN/L= 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(RQ35AE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 -5.000 .780 3.700
 .000 .700

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

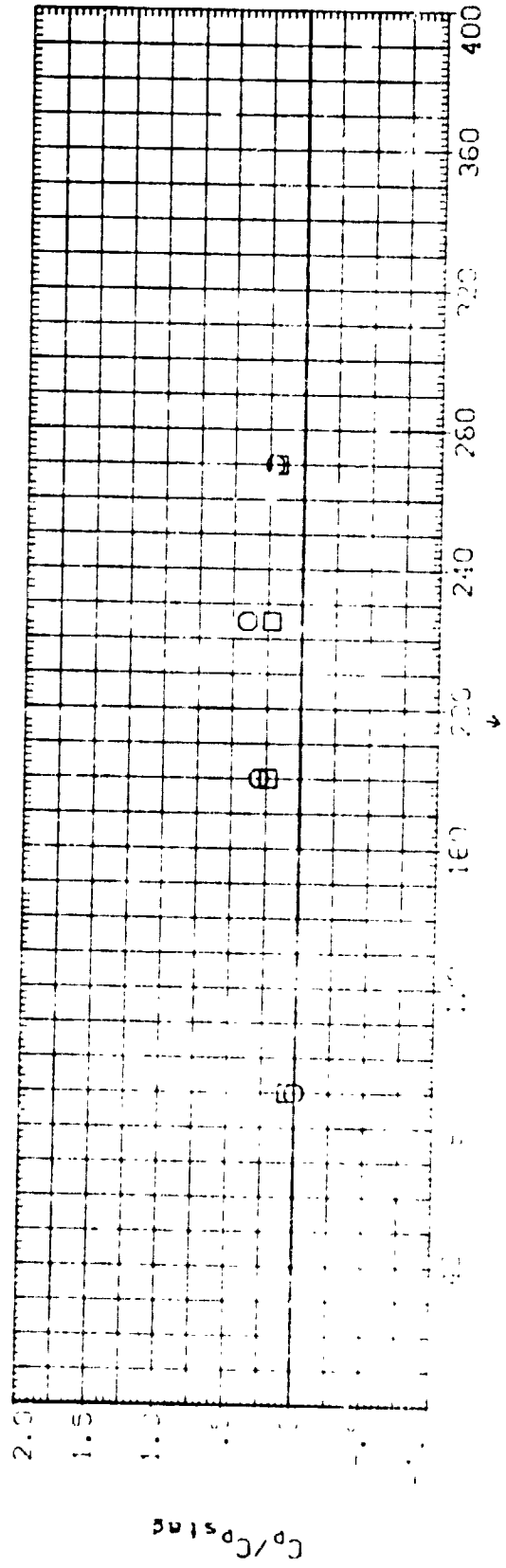
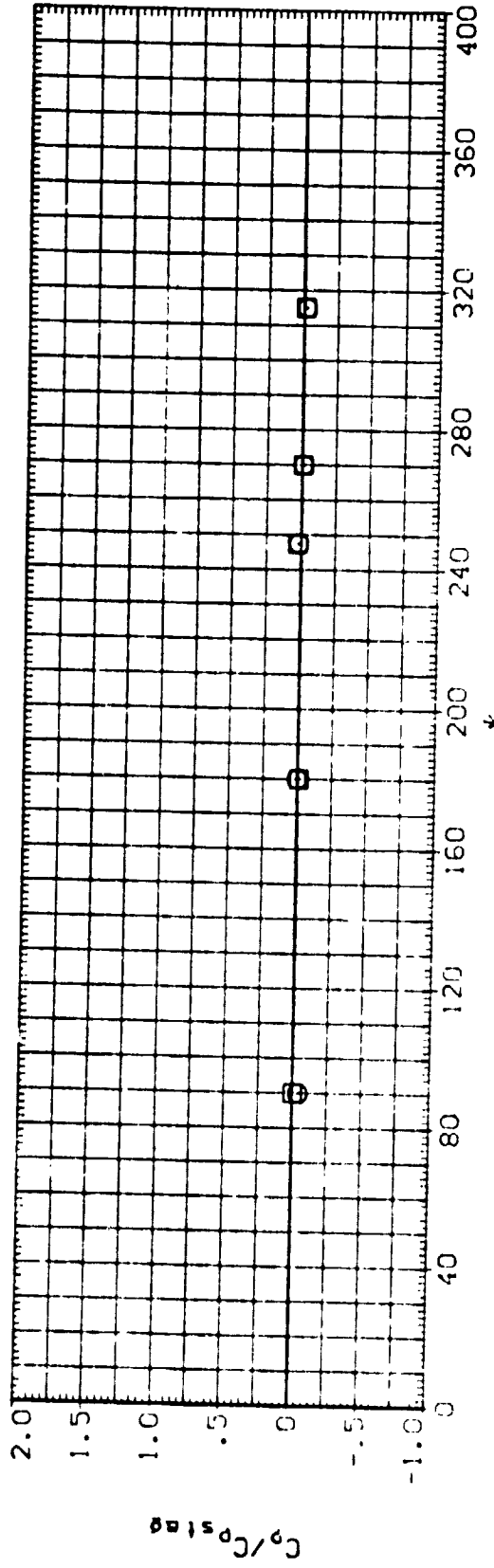


FIG. 33 VARIATION OF C_D/C_{D0} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 5. RN/L= 3.0

UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

ALPHA X/LSPB MACH
 -5.000 .930 3.700
 .000

PARAMETRIC VALUES
 RN/L BETA
 3.000 5.000

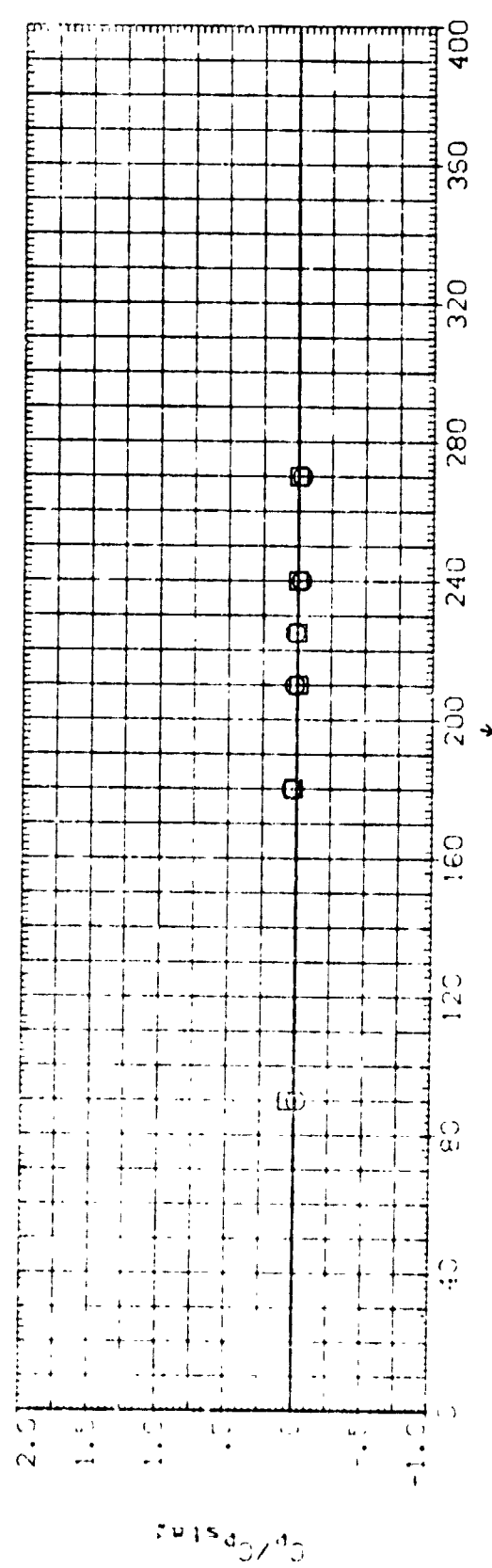
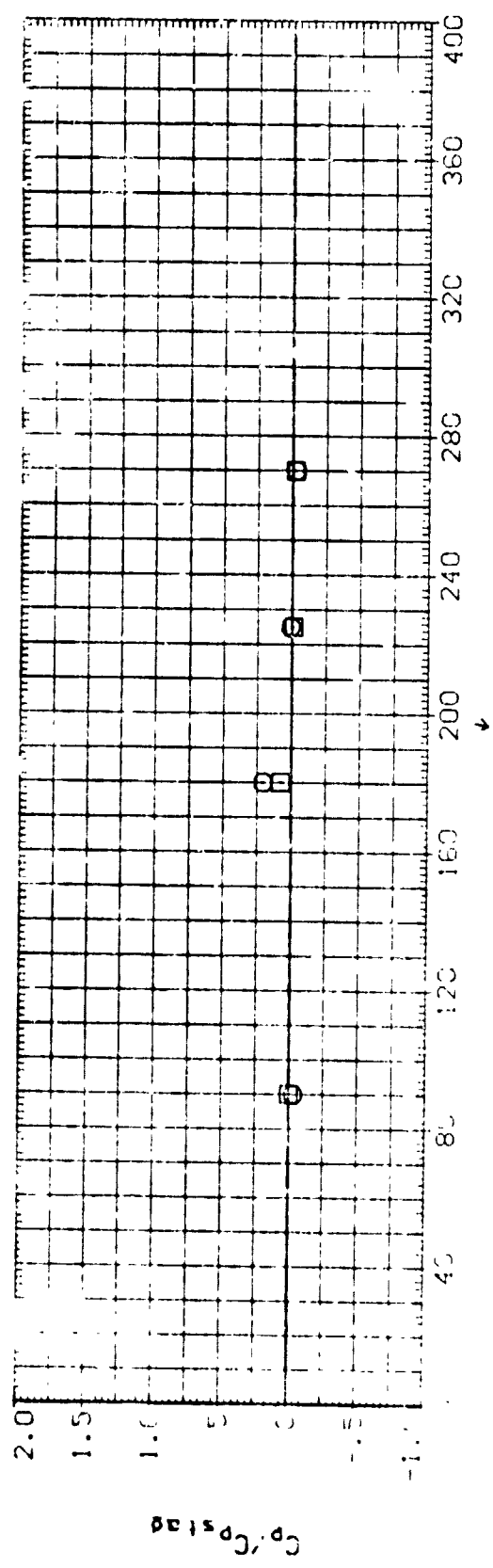


FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15, SOLID ROCKET BOOSTER, BETA= 5, RN/L= 3.0

(RQ3SAE) UPRT 1059 (IH4) 01-115-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA Y LSPB MACH
 -5.000 .930 3.750
 .000 .950

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

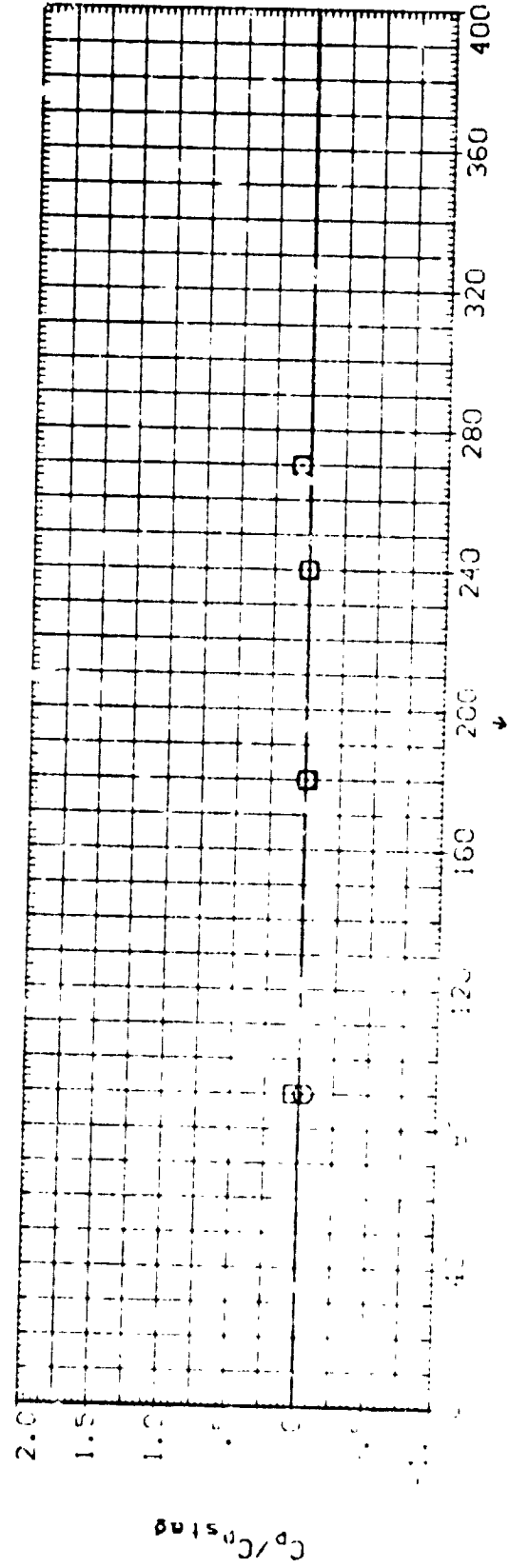
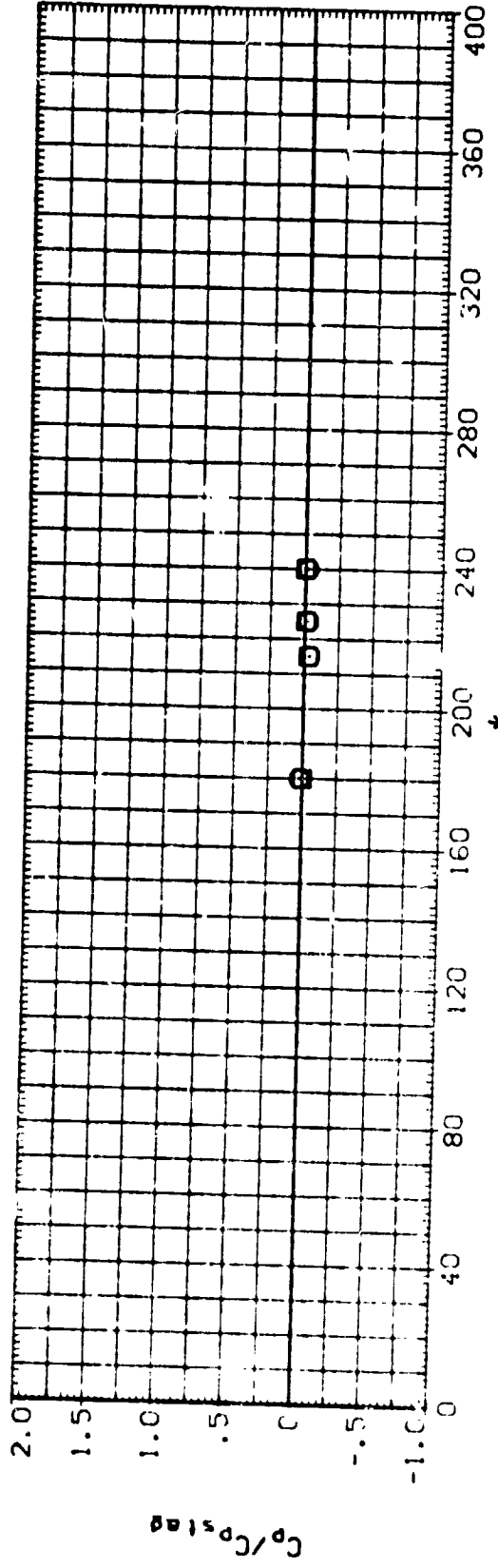
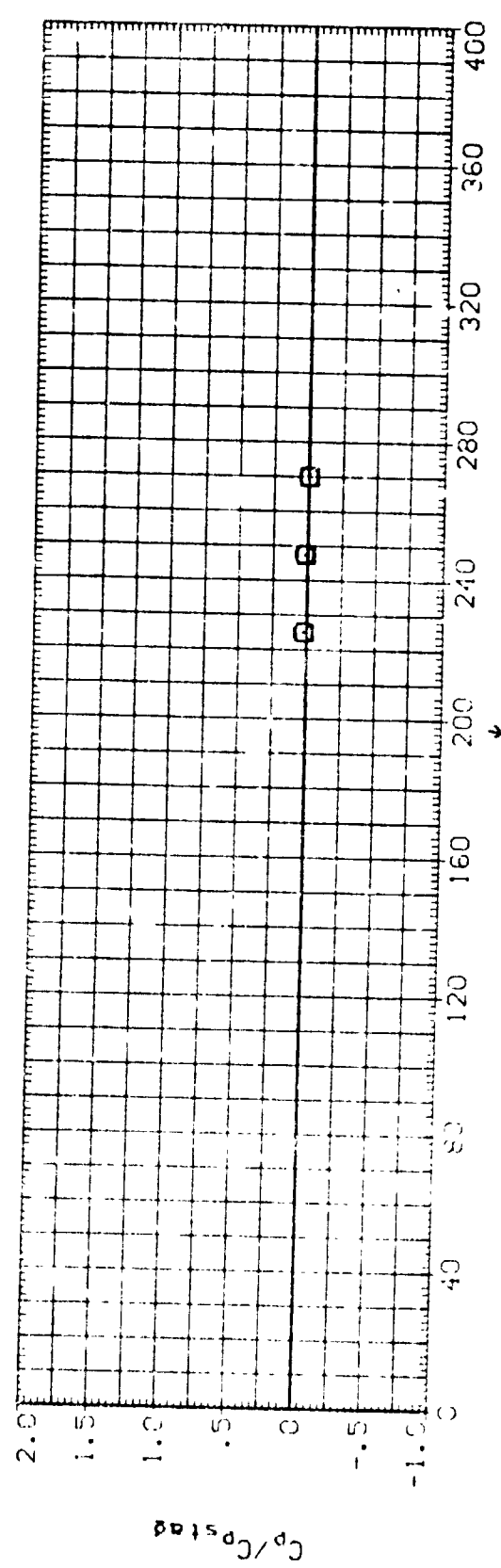
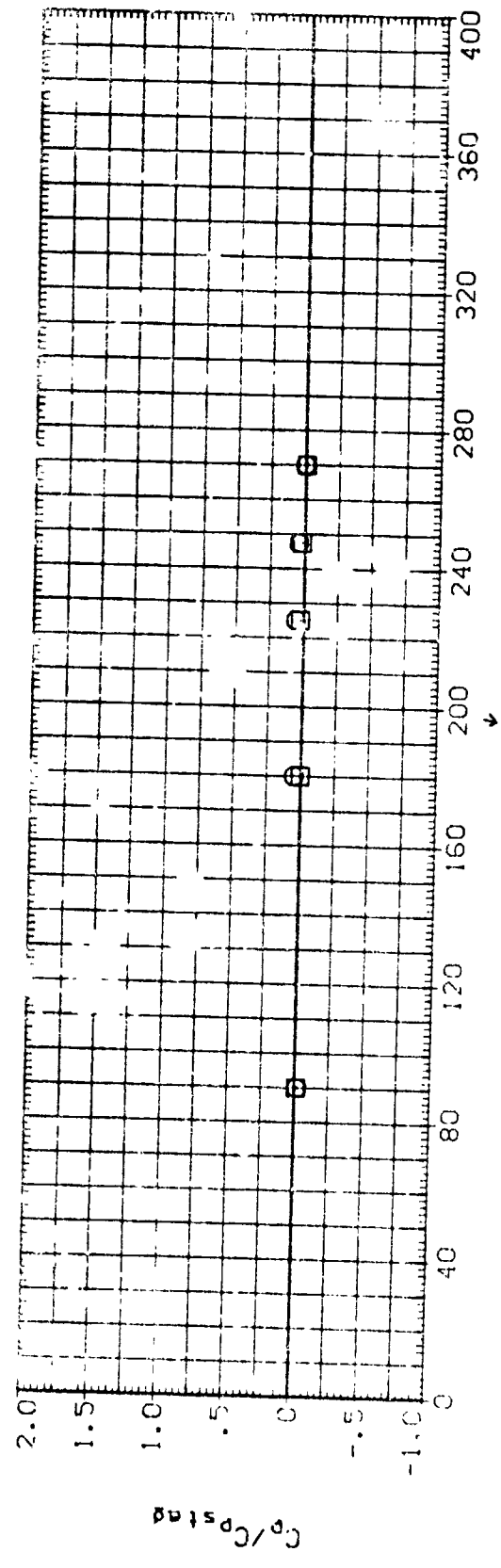


FIG. 33 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 5. RN/L= 3.0

(R03SAL) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/L SPB MACH
 -5.000 600 4.600
 .000 .400

RN/L 3.000 BETA 5.0/L



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FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKT BOOSTER. BETA= 5. RN/L= 3.0

(R039AE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSRB MACH
 -5.000 .780 4.600
 .000 .700

PARAMETRIC VALUES
 3.000 BETA 5.000

RN/L

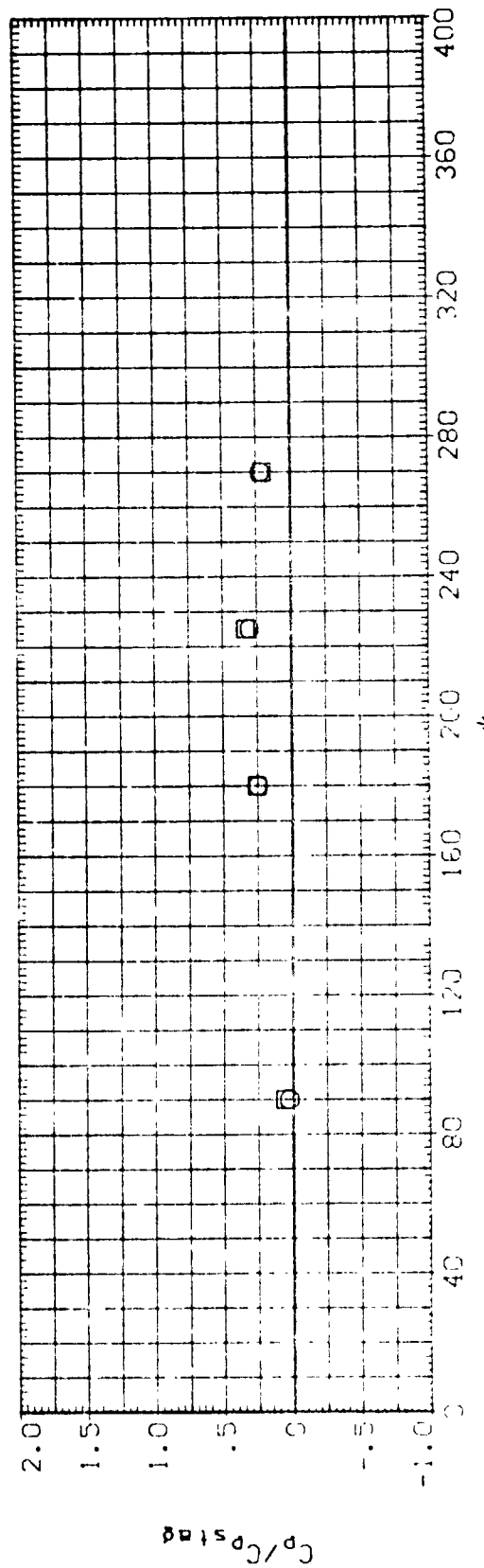
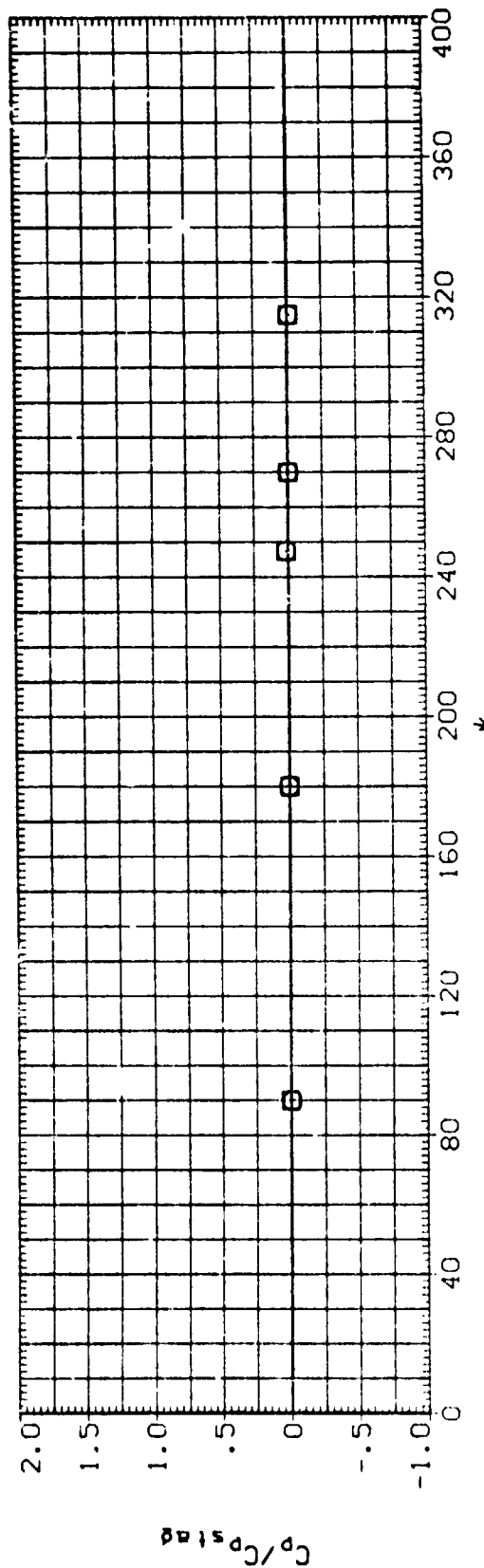


FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 5. RN/L= 3.0

(R035AE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/L S88 MACH
 -5.000 .900 4.600

PARAMETRIC VALUES
 RN/L 3.000 BETA

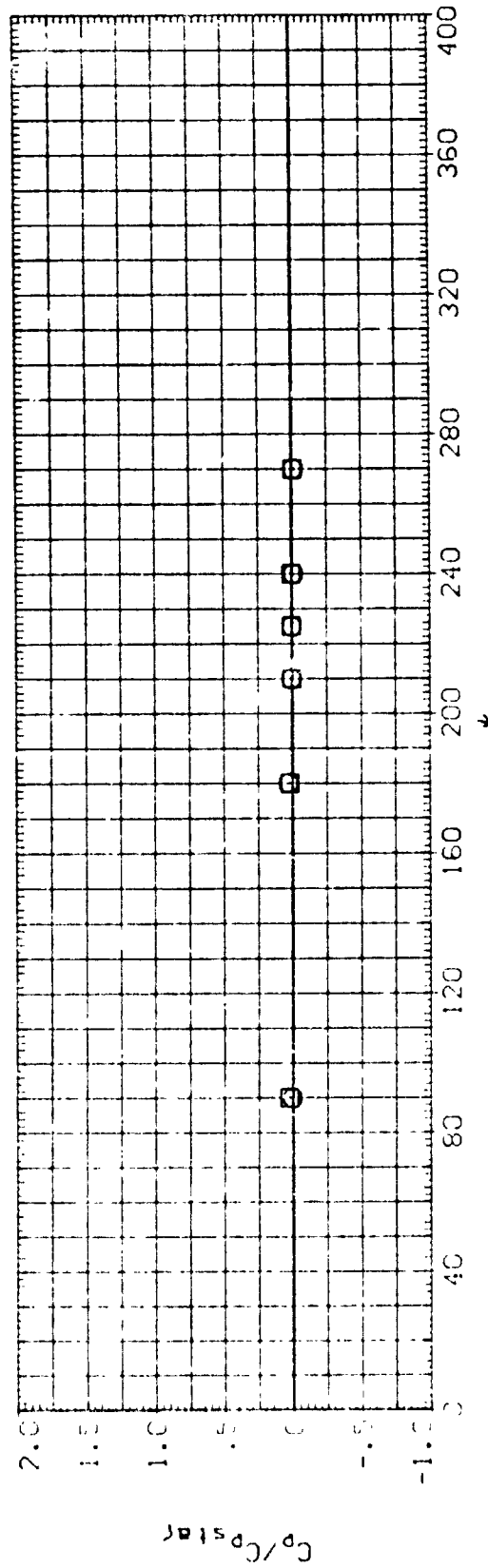
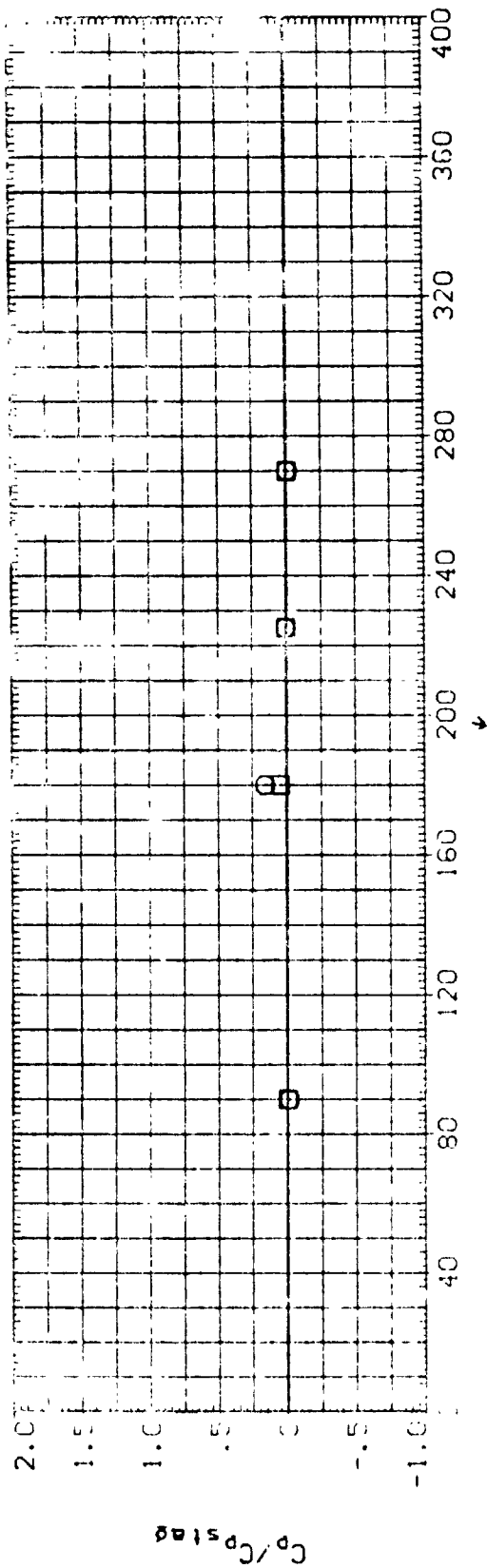


FIG. 33 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 5. RN/L= 3.0

(R03SAE) UPWT 1059 (IH4) 01-T15-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/SP8 MACH
 -5.000 .990 4.600
 .000 .960

PARAMETRIC VALUES
 RN/L 3.000 BETA 5.000

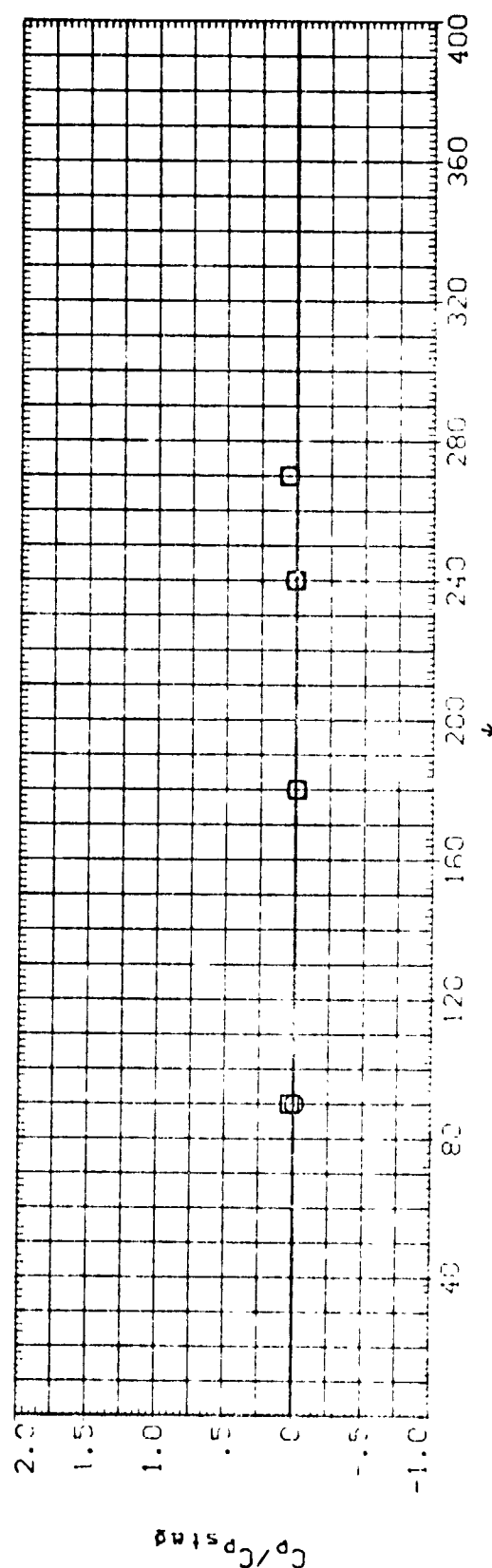
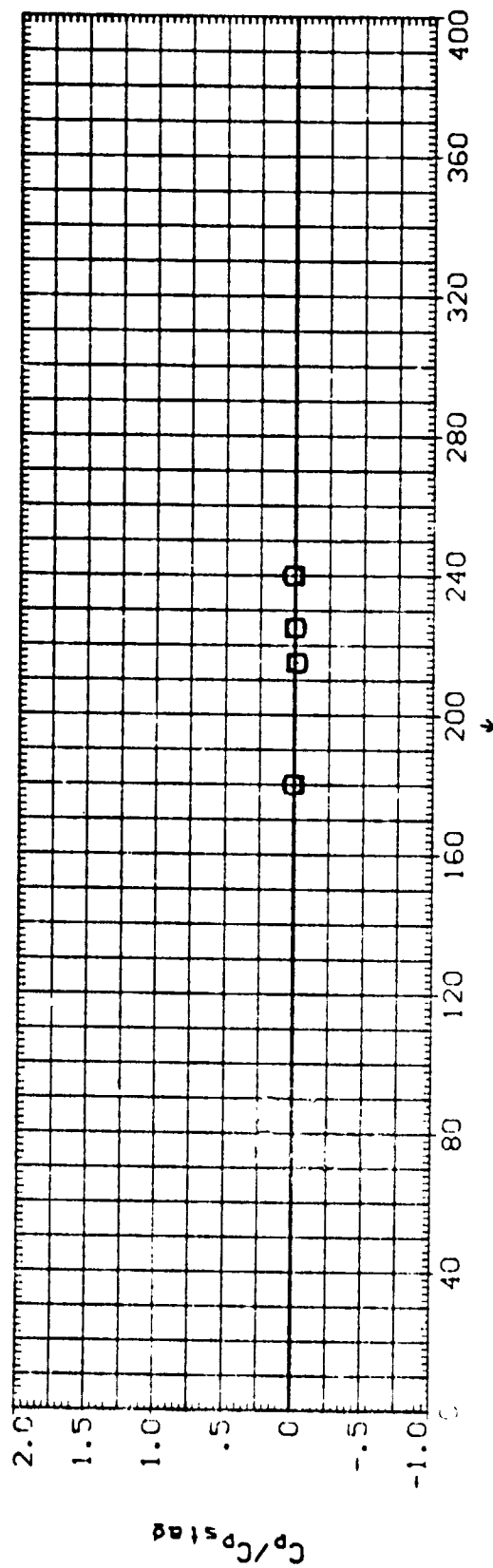


FIG. 33 VARIATION OF $C_p/C_{p_{stag}}$ ON THE INTEGRATED VEHICLE WITH T15. SOLID ROCKET BOOSTER. BETA= 5. RN/L= 3.0

(RQ3888) UPWT 1059 (IH4) 01-T22-S8N16 ORBITER FUSELAGE

SYMBOL ALPH₁
 -10.000
 -5.000
 5.000

MACH
 3.700

RN/L
 3.000
 BETA
 .000

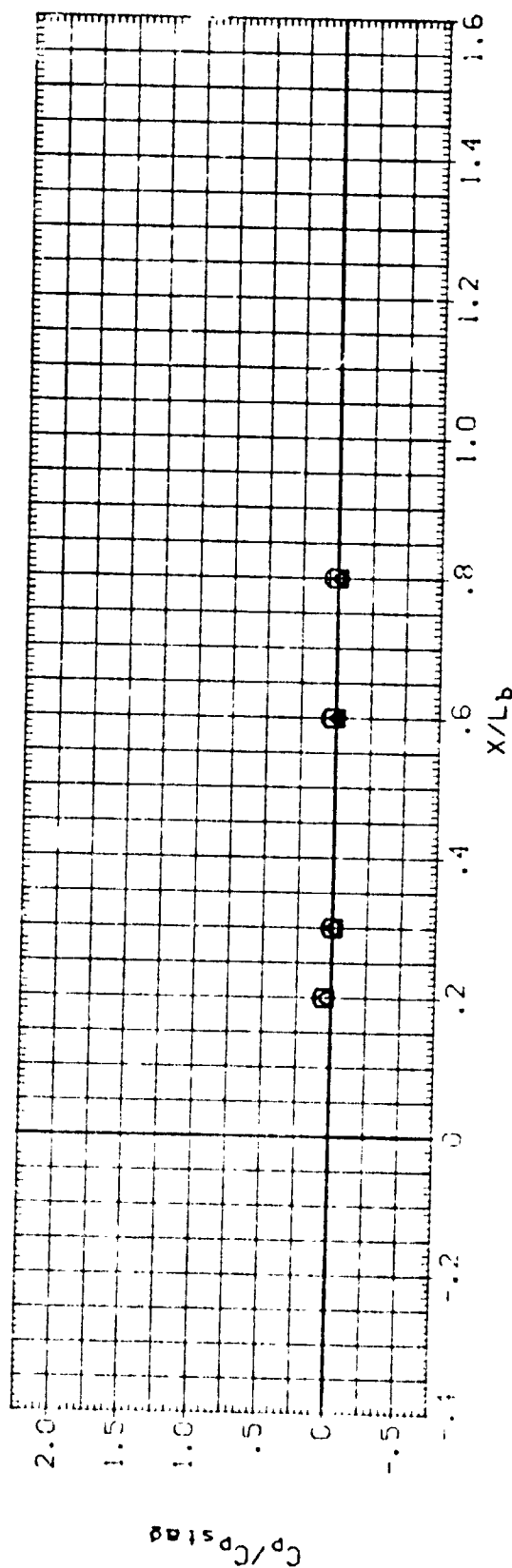
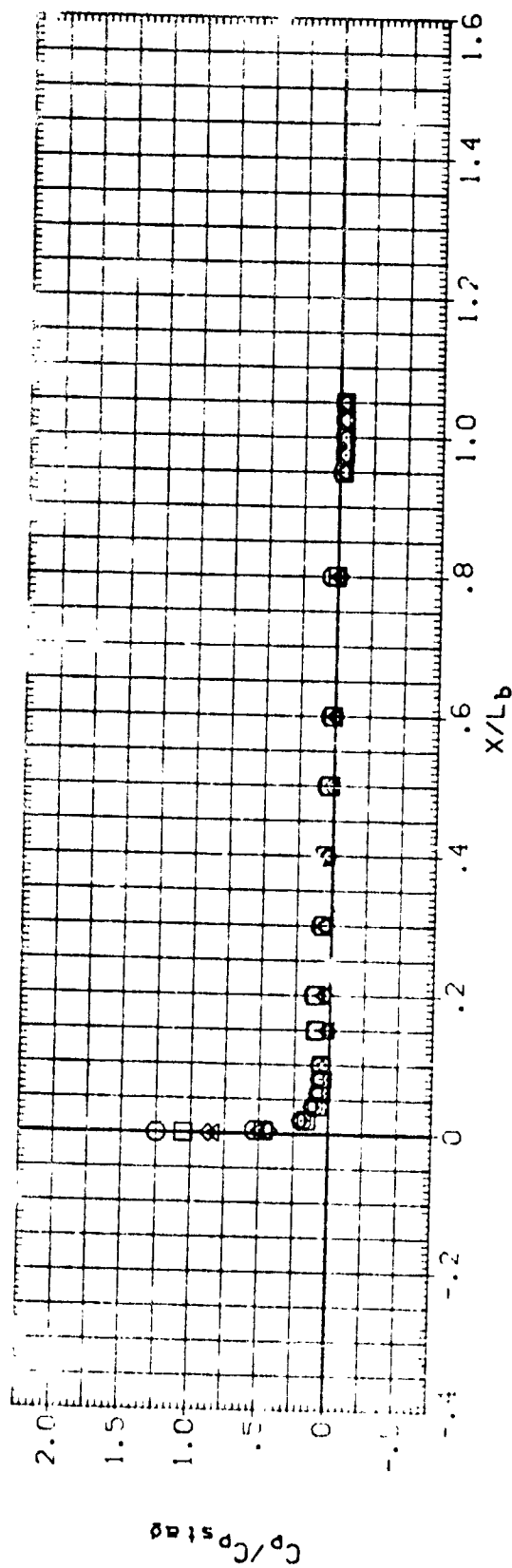


FIG. 34 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. ORBITER FUSELAGE. BETA = 0. RN/L = 3.0

REPRODUCIBILITY OF THE ORIGINAL PAGE IS POOR

(R03BBB) UPWT 1059 (IH4) 01-T22-S8N16 ORBITER FUSELAGE

SYMBOL ALPHA PHI MACH
 -10.000 180.000 3.700
 -5.000 122.700
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

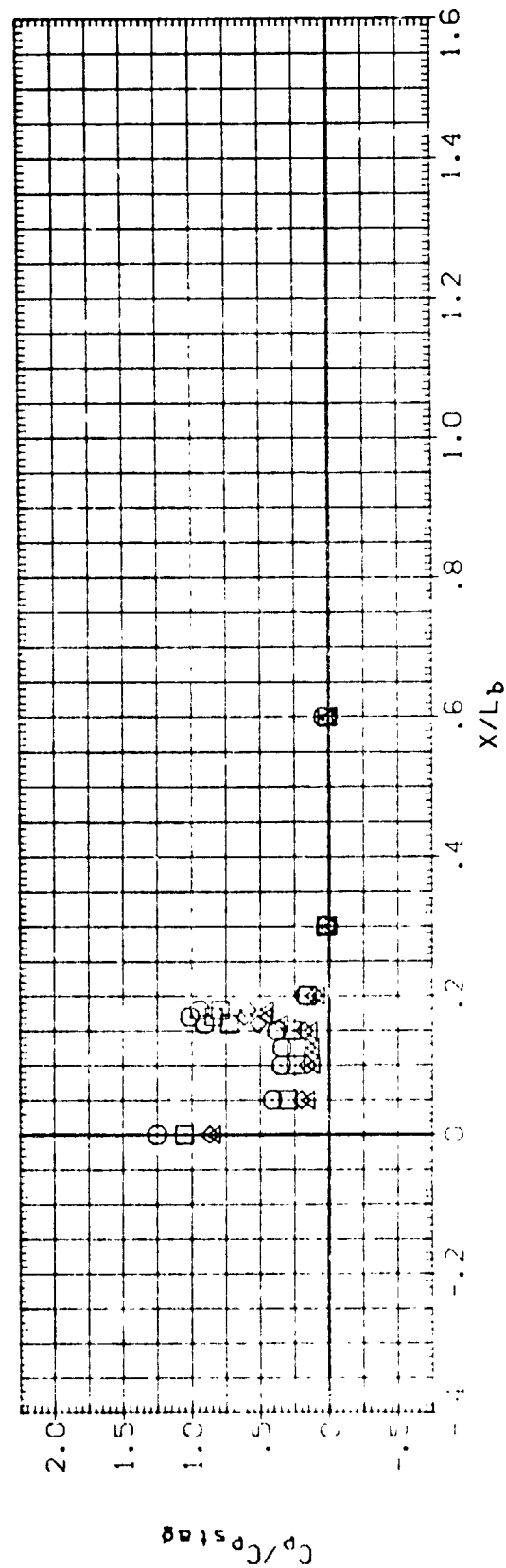
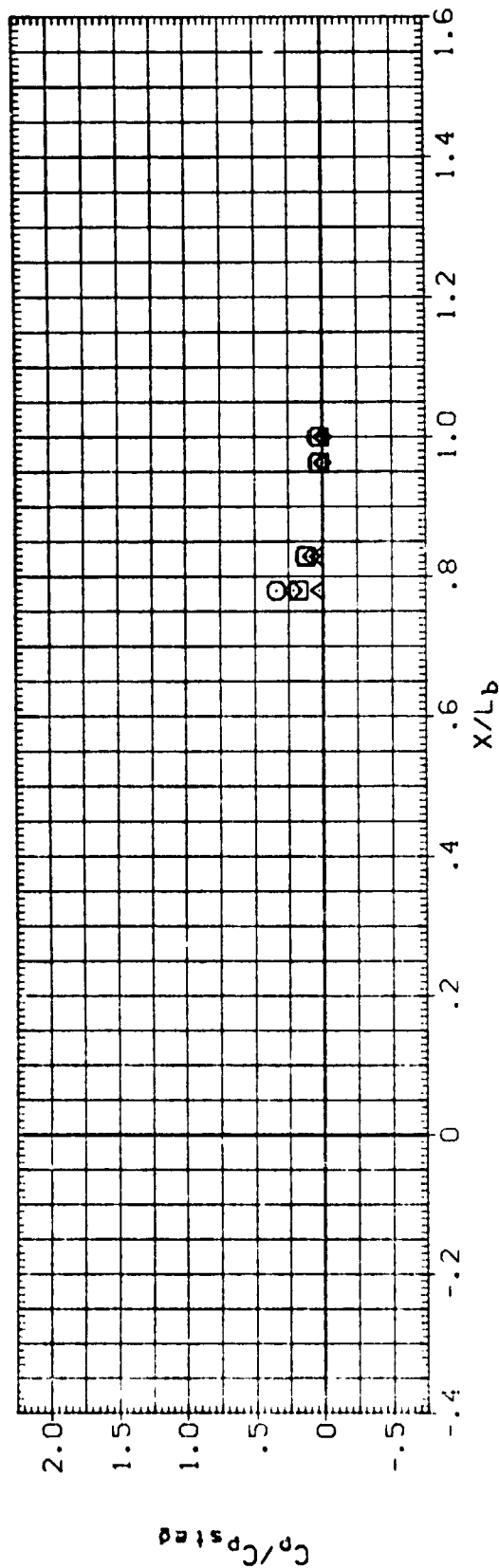


FIG. 34 VARIATION OF C_p/C_{pstag} ON THE INTEGRATED VEHICLE WITH T22. ORBITER FUSELAGE. BETA = 0. RN/L = 3.0

(R33888) CWT 1059 (IH4) 01-T22-S8N16 ORBITER FUSELAGE

SYMBOL ALP/A PHI MACH
 -10.000 95.000 4.60
 -5.000 .000
 .000
 5.000

PARAMETRIC VALUES
 3.000 8E11 .00

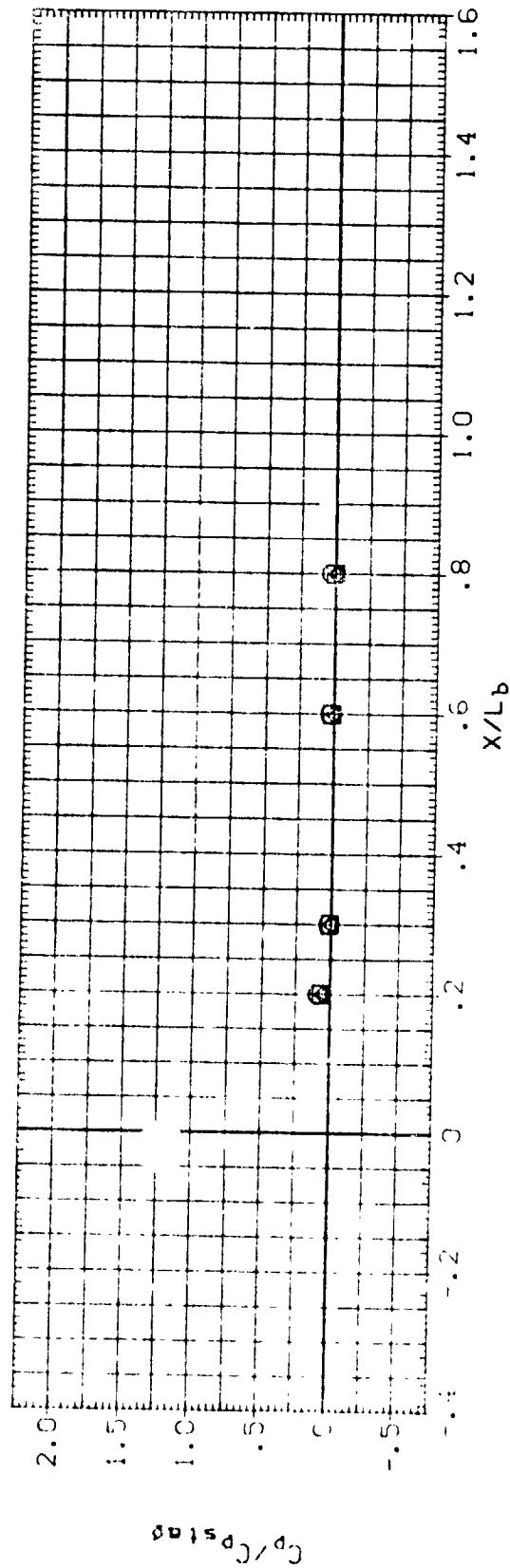
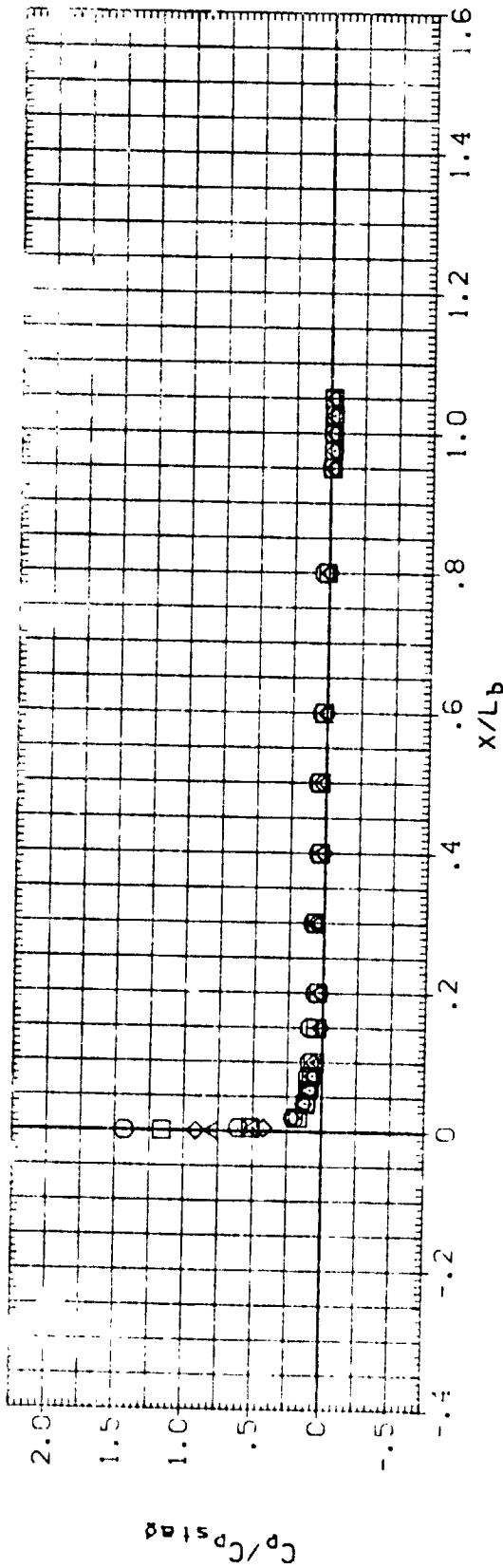


FIG. 34 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

[R03888] UPWT 1059 (IH4) 01-T22-S8N16 ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
□	-10.000	180.000	4.600		BETA
◇	-5.000	122.700		3.000	.000
	.000				
	5.000				

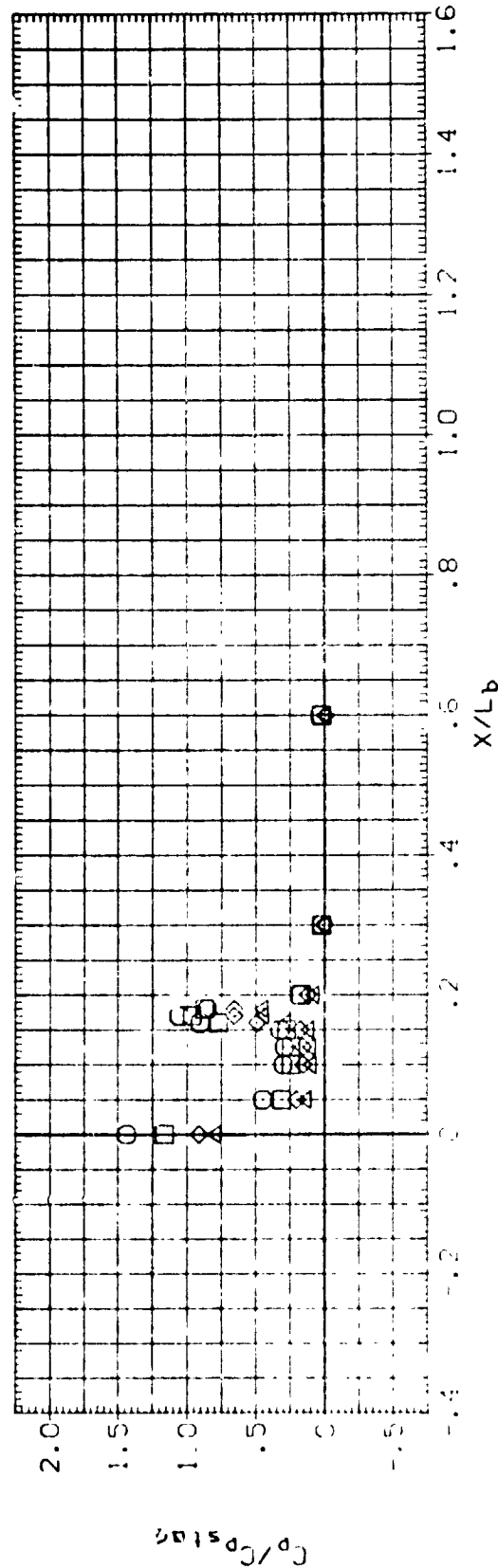
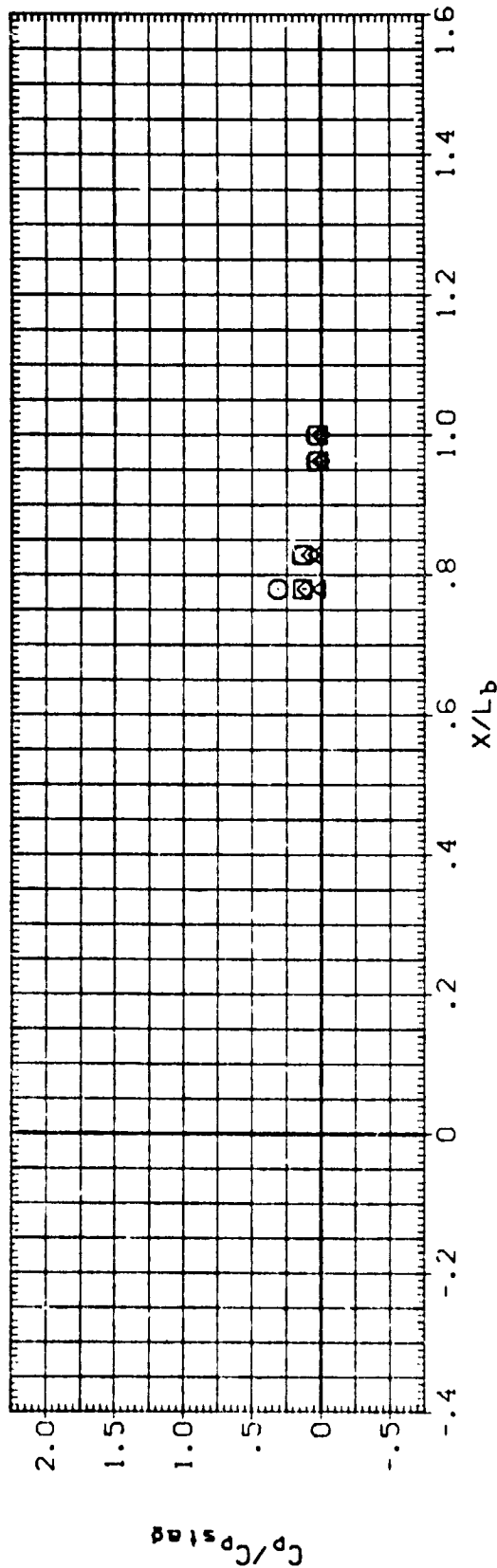


FIG. 34 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(R03BR2) UPWT 1059 (IH4) 01-T22-S8N16 ORBITER FUSELAGE

SYMBOL ALPH X/LB MACH 3.700
 -10.000
 -5.000
 .000
 5.000

PARAMETRIC VALUES
 3.000 BET/

RN/L

.00

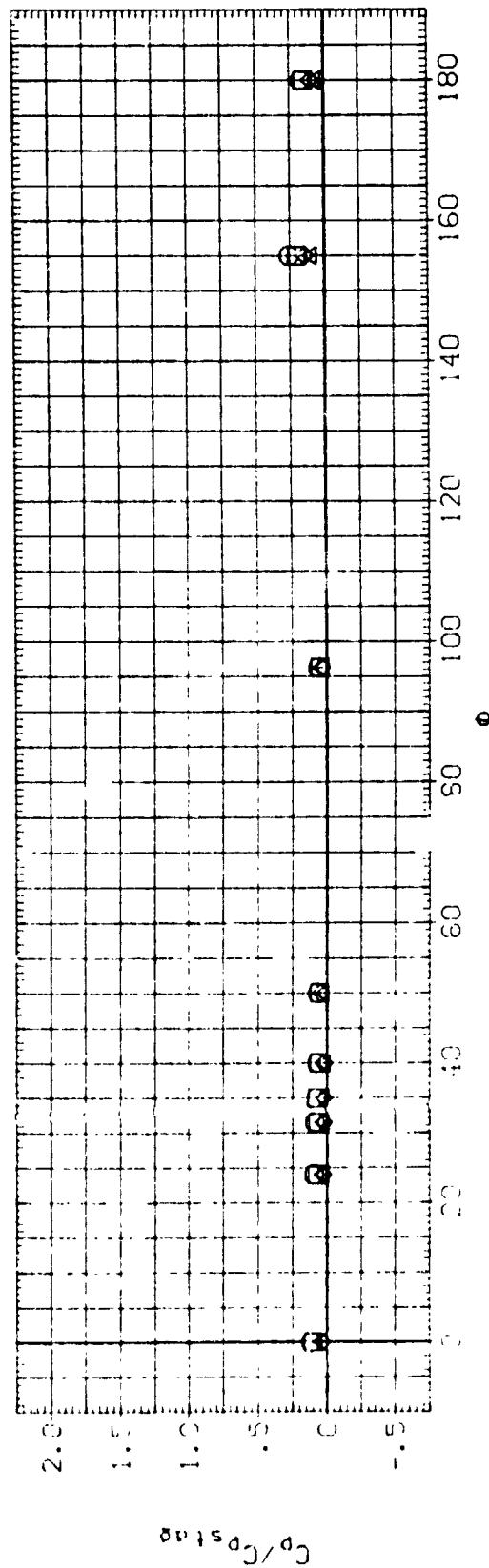
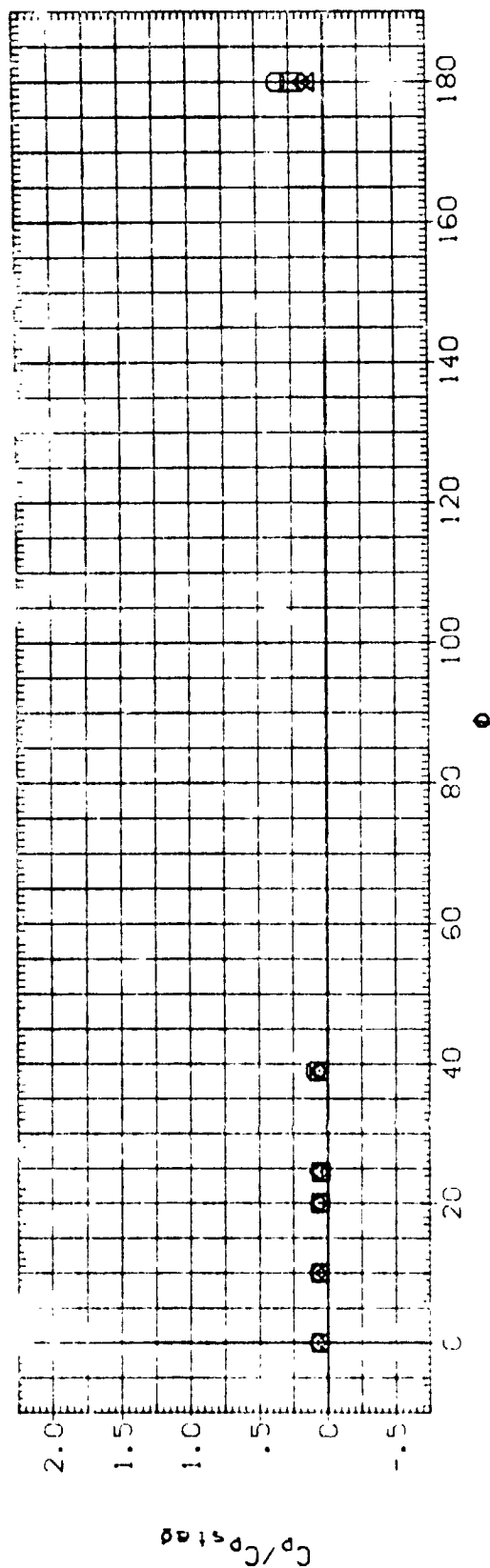


FIG. 34 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(RQ3328) UOWT 1059 (IH4) 01-T22-S8N16 ORBITER FUSELAGE

PARAMETRIC VALUES
RN/L 3.000 BETA .000

SYMBOL ALPHA X/L-B MACH
-10.000 .600 3.700
-5.000 .300
0.000
5.000

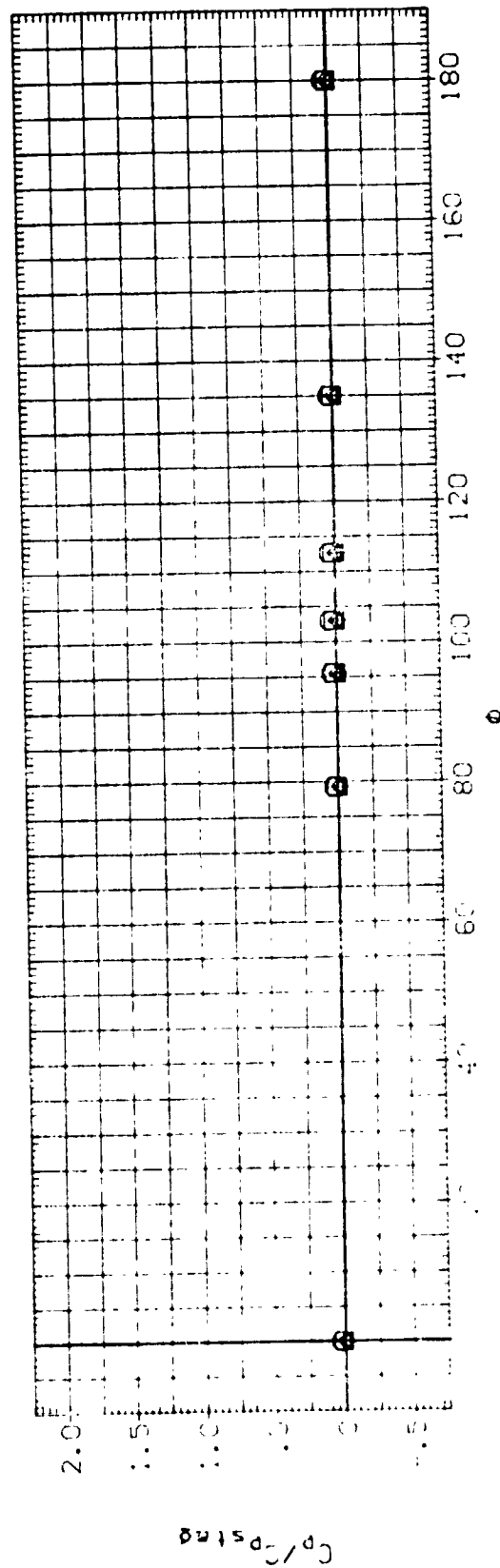
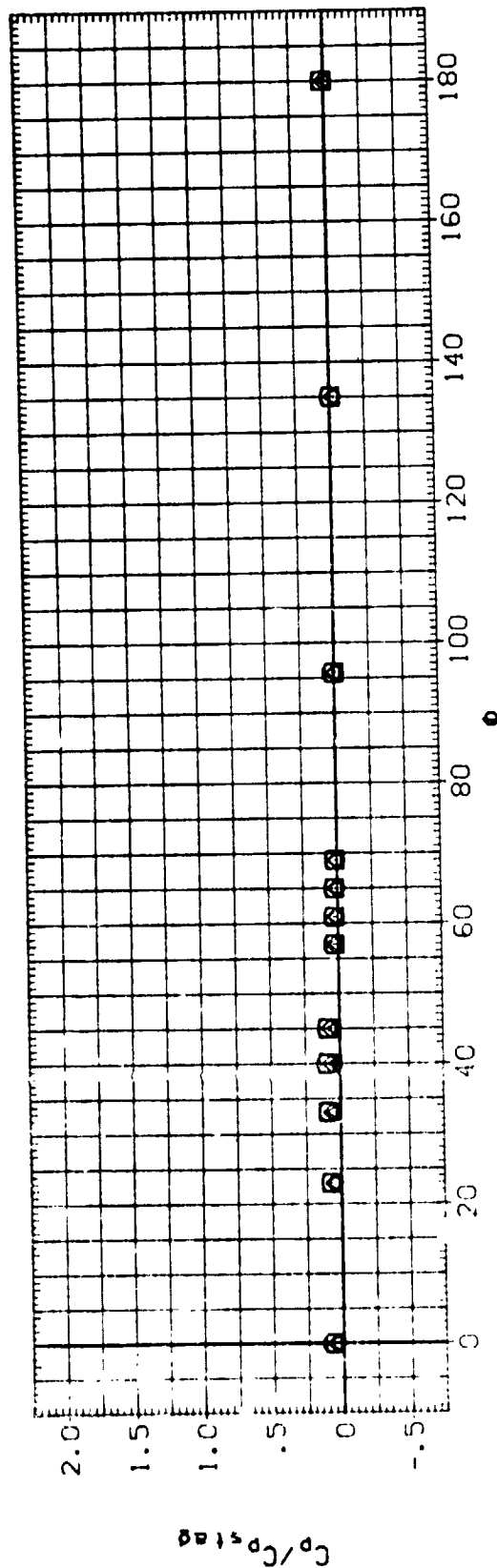


FIG. 34 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(R0388B) UPWT 1059 (IH4) 01-T22-S8N16 ORBITER FUSELAGE

ALPHA
-15.000
-5.000
-1.000
5.000

W/LB
200
100

MACH
4.600

PARAMETRIC VALUE
RN/L 3.000 BETA .000

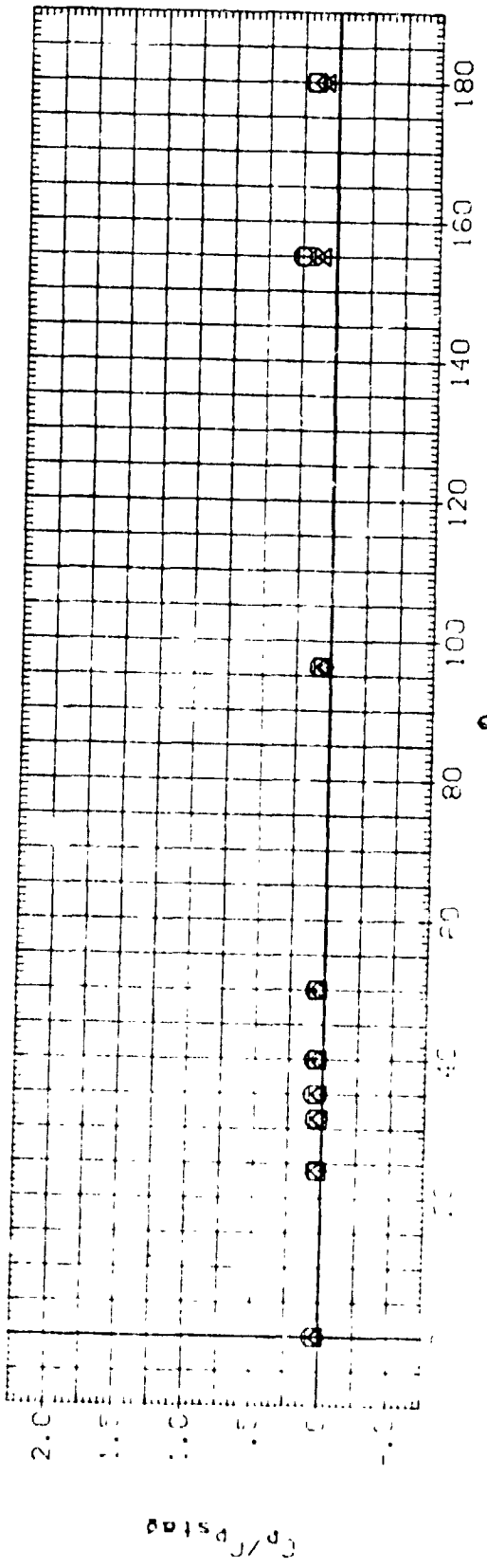
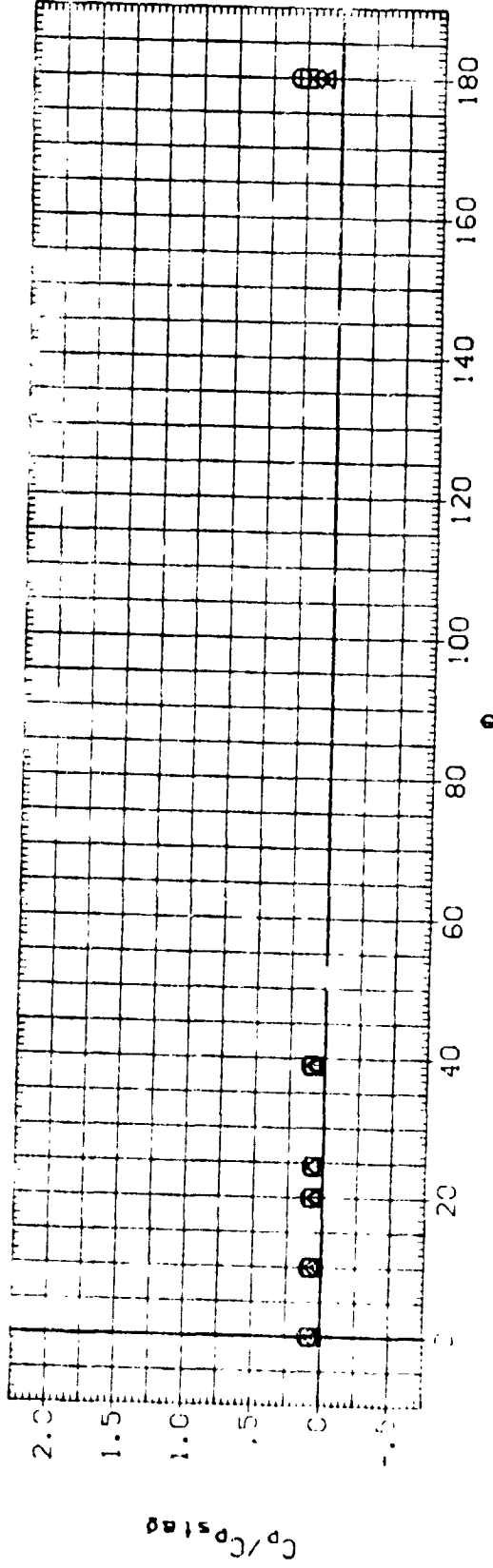


FIG. 34 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. ORBITER FUSELAGE. BETA= 0, RN/L= 3.0

(RQ388B) UPWT 1059 (IH4) 01-T22-S8N16 ORBITER FUSELAGE

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH
4.600

X/LB
.600
.300

ALPHA
-10.000
-5.000
0.000
5.000

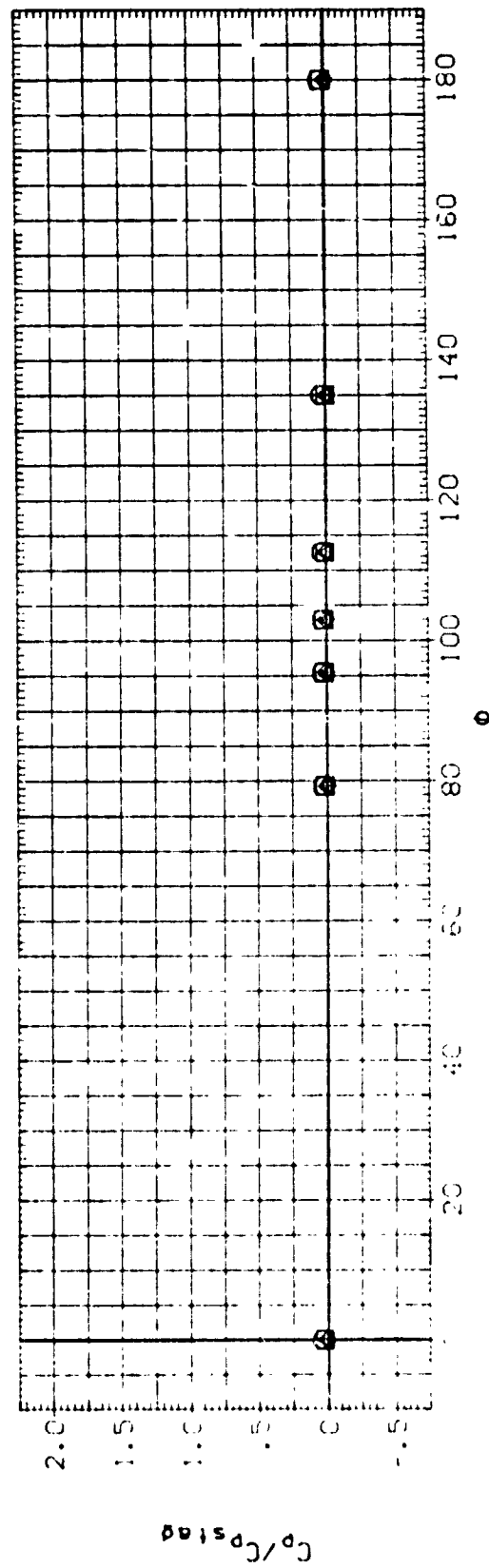
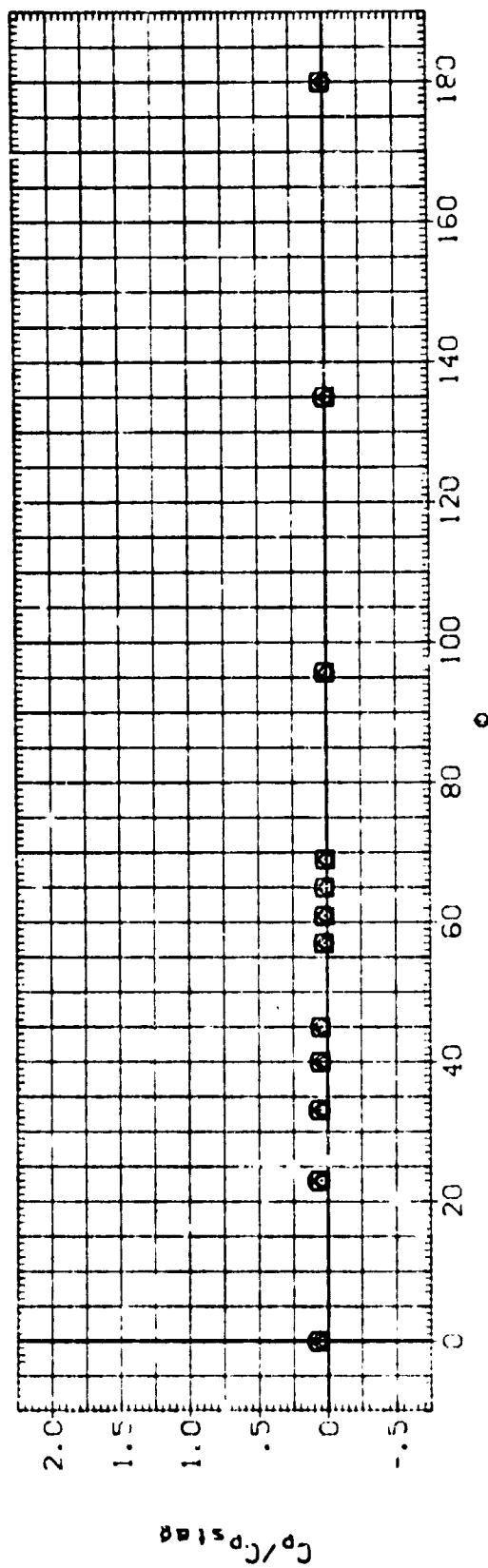


FIG. 34 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. ORBITER FUSELAGE. BETA= 0. RN/L= 3.0

(R03L88) UFWT 1059 (IH4) 01-T22-S8N16 ORB. LOWER WING

SYNTHESIS
ALPHA 15.000
MACH 3.75
RN/L 0.000
BETA 0.000

PARAMETRIC VALUES
3.000 BETA .0

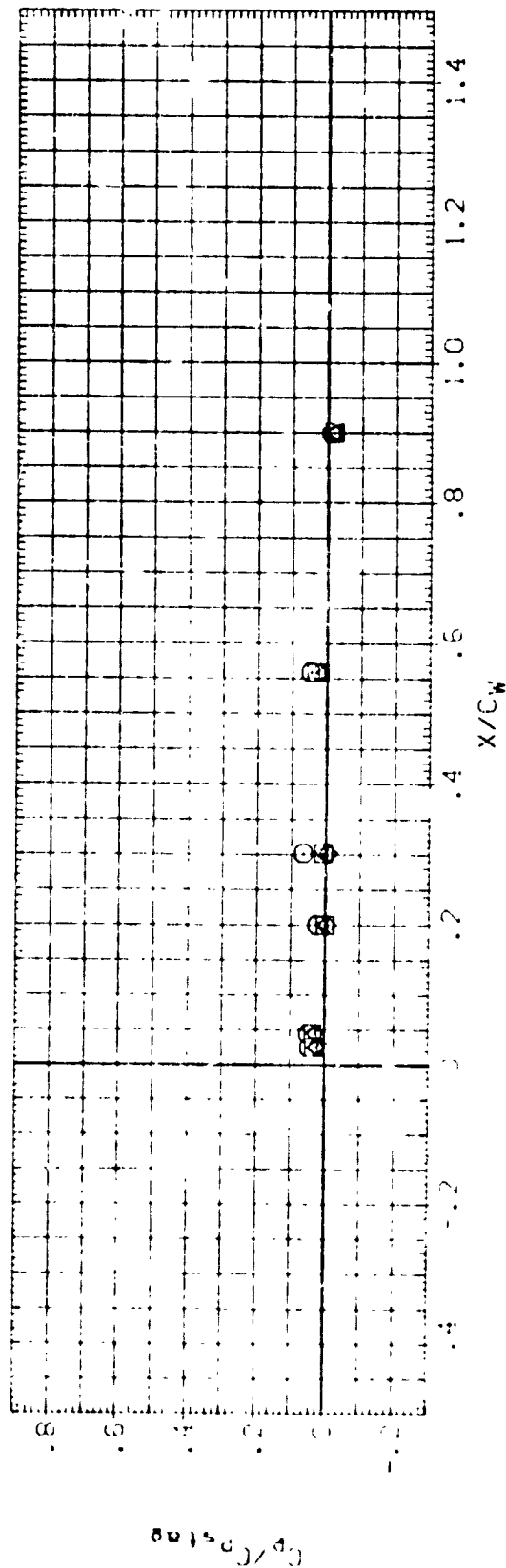
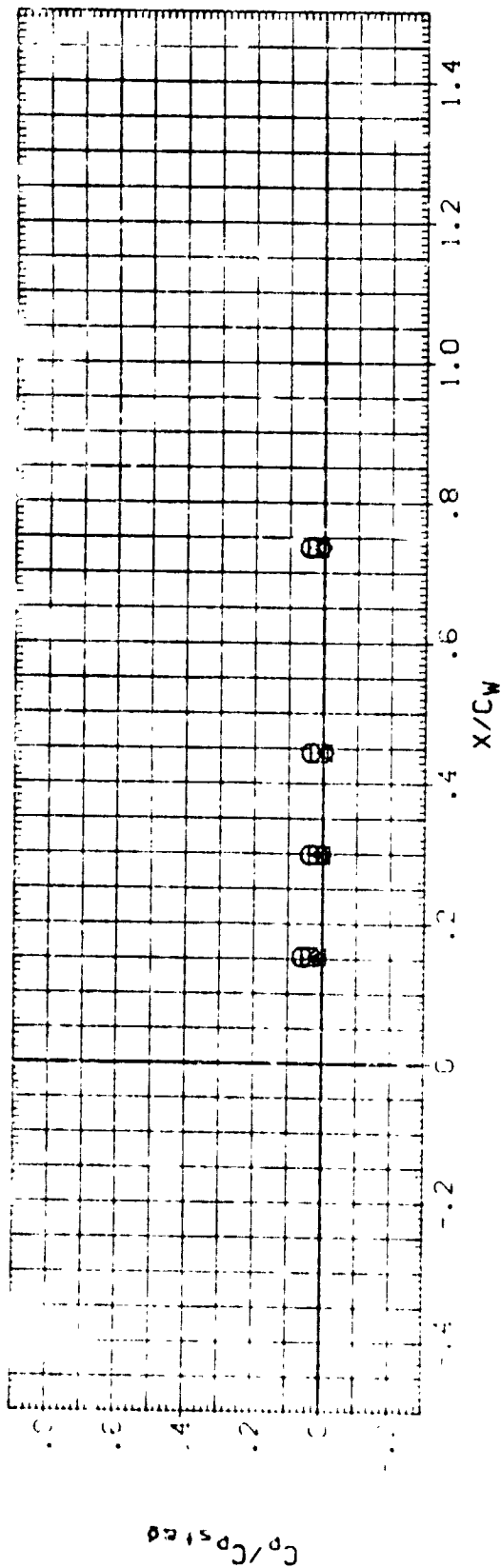


FIG. 35 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

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(R03LBB)
SYMBOL

UPWT 1059 (IH4) 01-T22-S8N16 ORB. LOWER WING

ALPHA
-10.000
-5.000
0.000
5.000

2Y/8V
.850
.750

MACH
3.700

PARAMETRIC VALUES
RN/L 3.000 BETA .000

.000

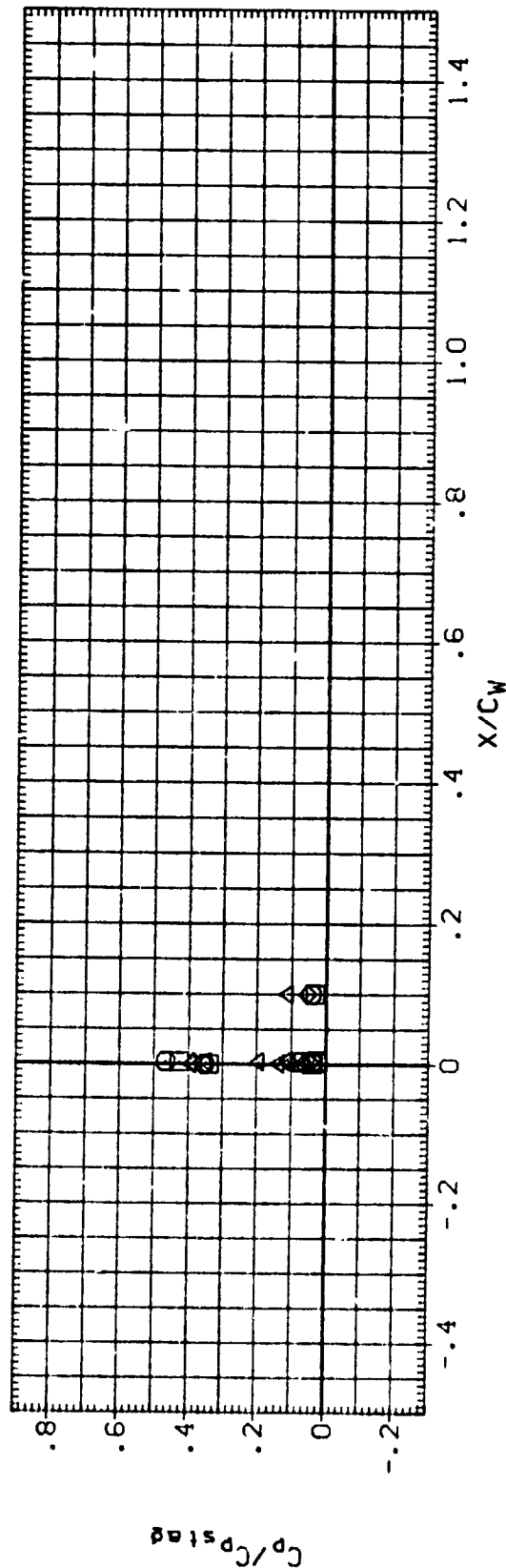
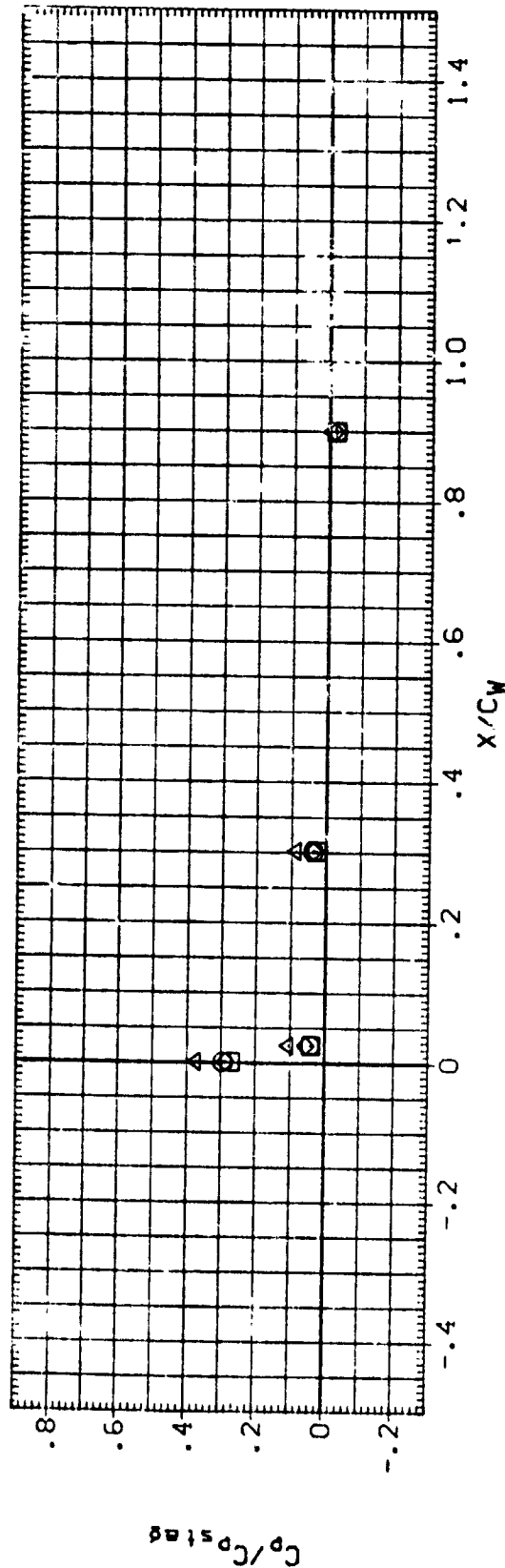


FIG. 35 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, ORBITER LOWER WING, BETA= 0, RN/L= 3.0

(R03LBB) UPWT 1059 (IH4) 01-T22-S8N16 ORB. LOWER WING

SYMBOL ALPHA
 -10.000
 -5.000
 .000
 5.000

ZY/BV MACH
 .400 4.600
 .250

PARAMETRIC VALUES
 3.000 BETA .000

RN/L

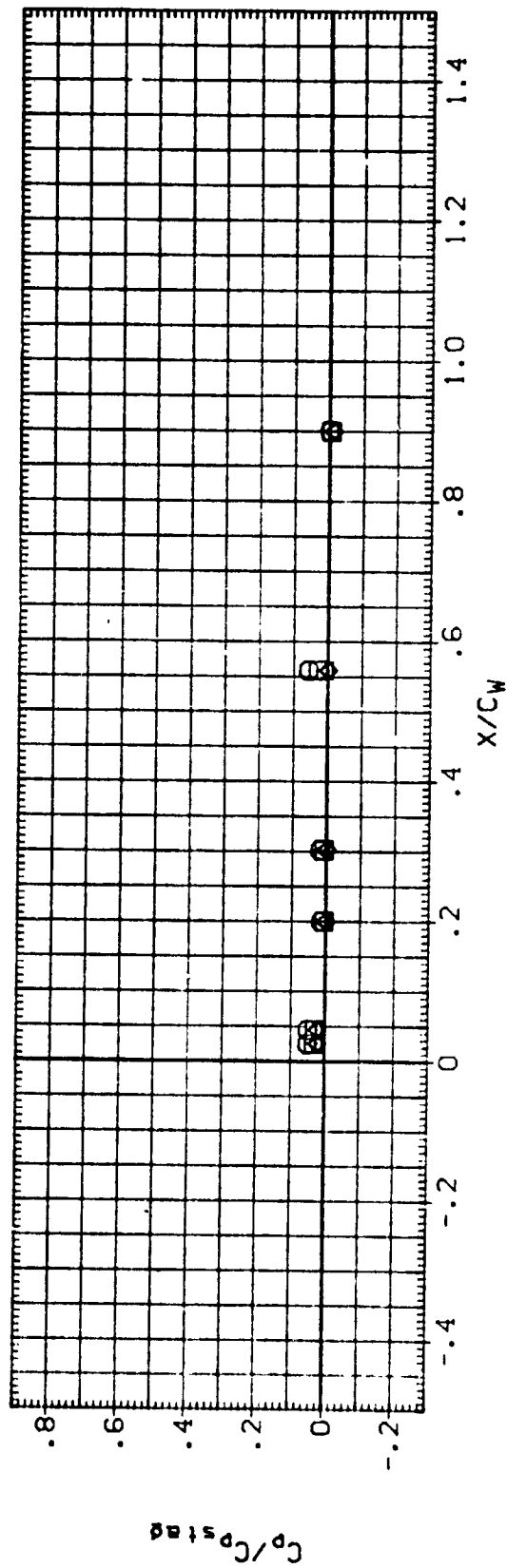
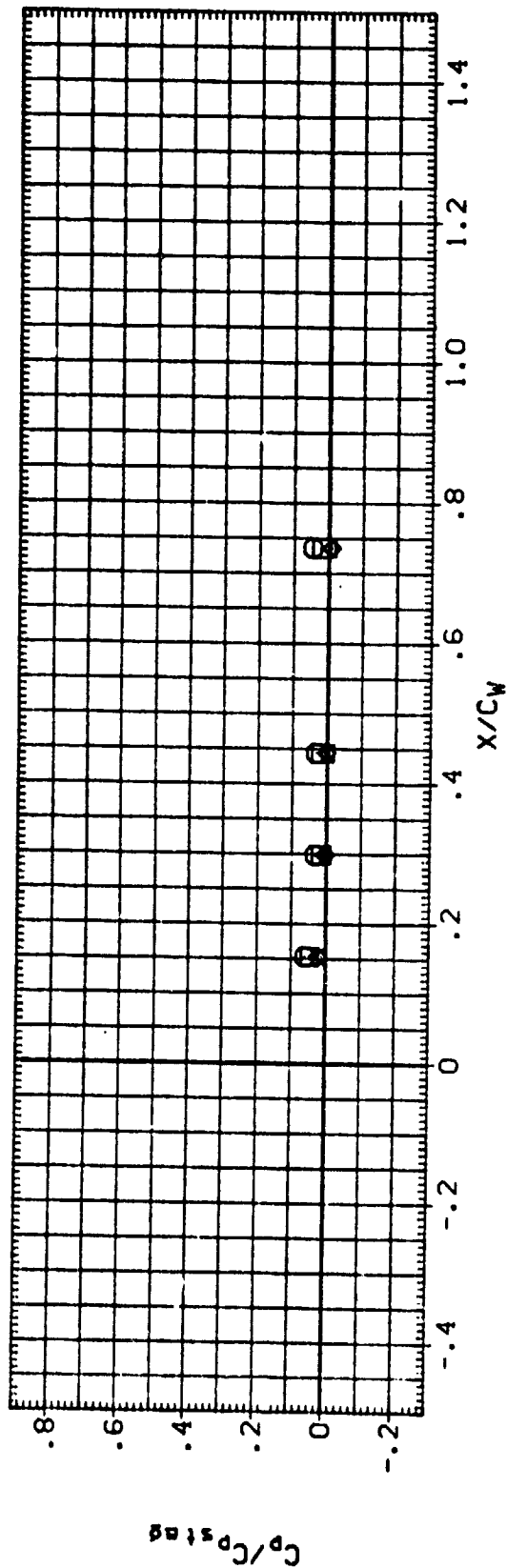


FIG. 35 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(R03LBB) UPWT 1059 (IH4) 01-T22-S8N16 ORB. LOWER WING

SYMBOL ALPHA 2Y/BV MACH
 -10.000
 -5.000
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA .000

RN/L

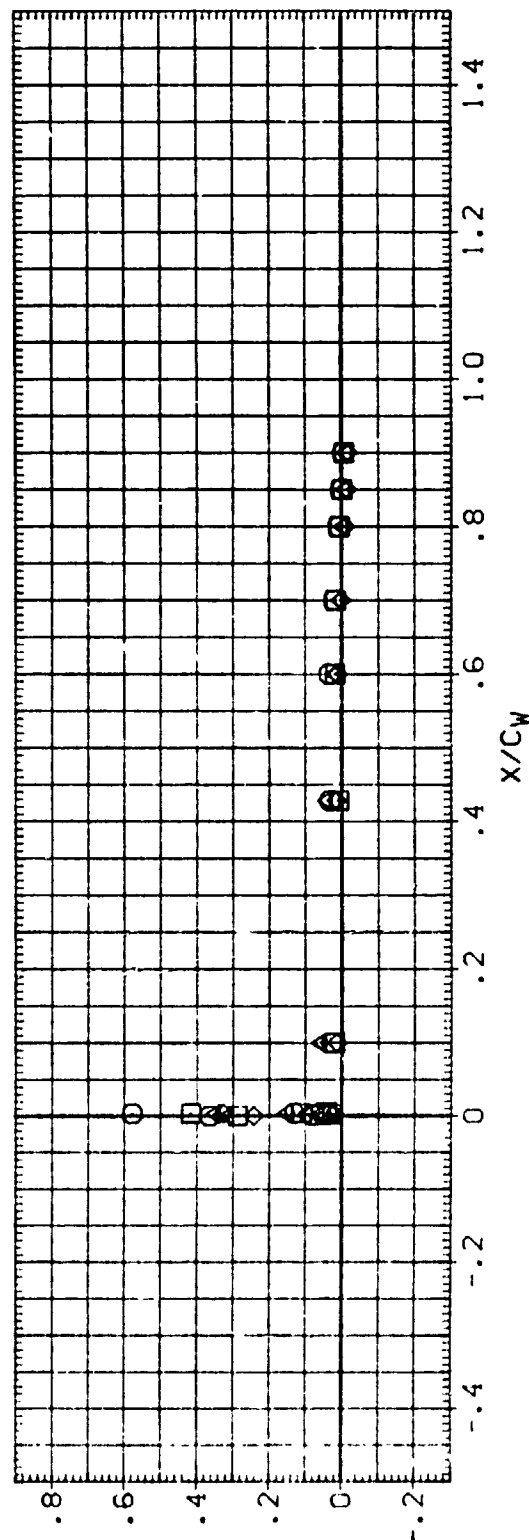
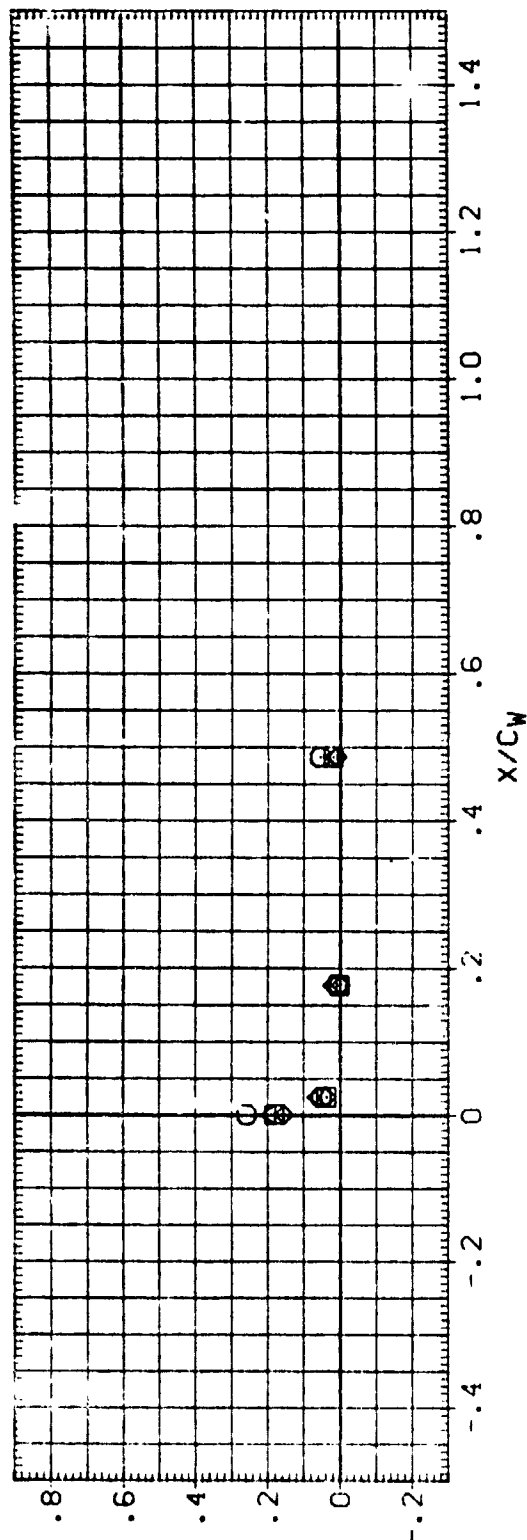


FIG. 35 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(R03LBB) UPWT 1059 (IH4) 01-T22-S8N16 ORB. LOWER WING

SYMBOL	ALPHA	2Y/8V	MACH	RN/L	PARAMETRIC VALUES
○	-10.000	.850	4.600		3.000 BETA .000
□	-5.000	.750			
△	.000				
×	5.000				

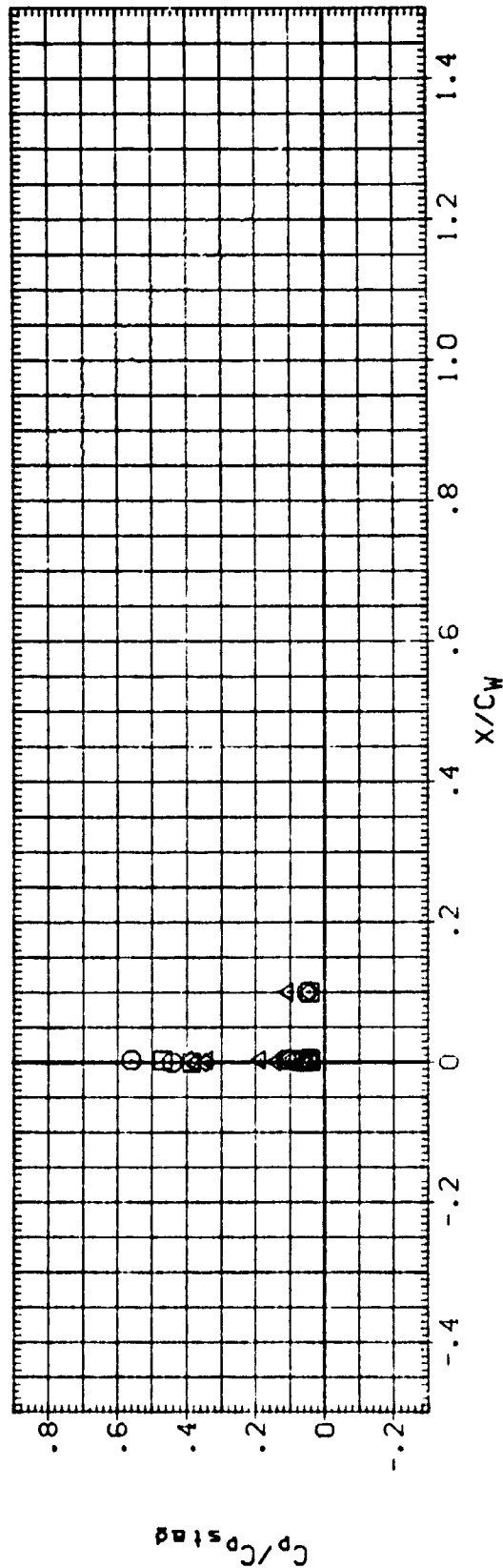
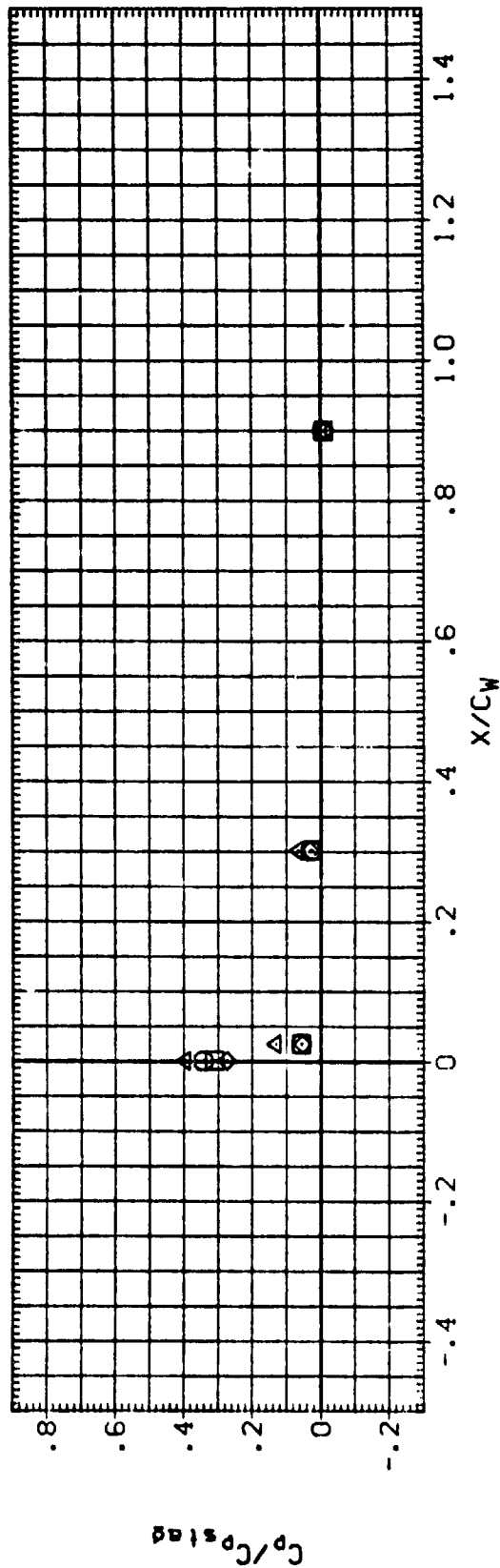


FIG. 35 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. ORBITER LOWER WING. BETA= 0. RN/L= 3.0

(RQ3UBB) UPWT 1059 (IH4) 01-T22-S8N16 ORB. UPPER WING

SYMBOL	ALPHA	2Y/BV	MACH	RN/L	PARAMETRIC VALUES
○	-10.000	.80%	3.700		3.000 BETA .000
□	-5.000	.600			
◇	-0.00	.400			
△	5.000				

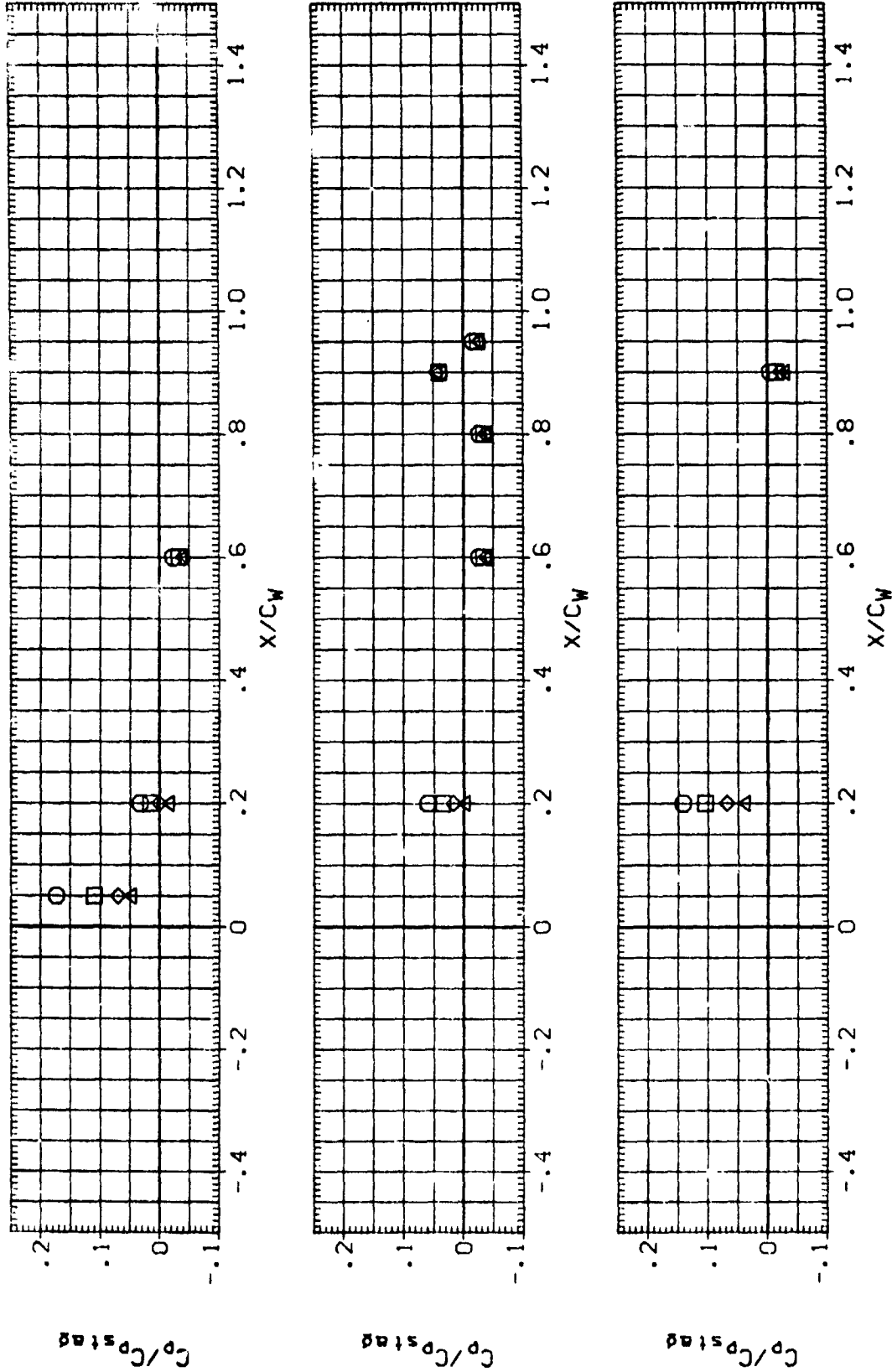


FIG. 36 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. ORBITER
UPPER WING. BETA= 0. RN/L= 3.0

(R03UBB) UPWT 1059 (IH4) 01-T22-S8N16 ORB. UPPER WING

SYMBOL	ALPHA	2Y/BV	MACH	RN/L	PARAMETRIC VALUES
○	-10.000	.800	4.600		3.000 BETA .000
□	-5.000	.600			
◇	.000	.400			
×	5.000				

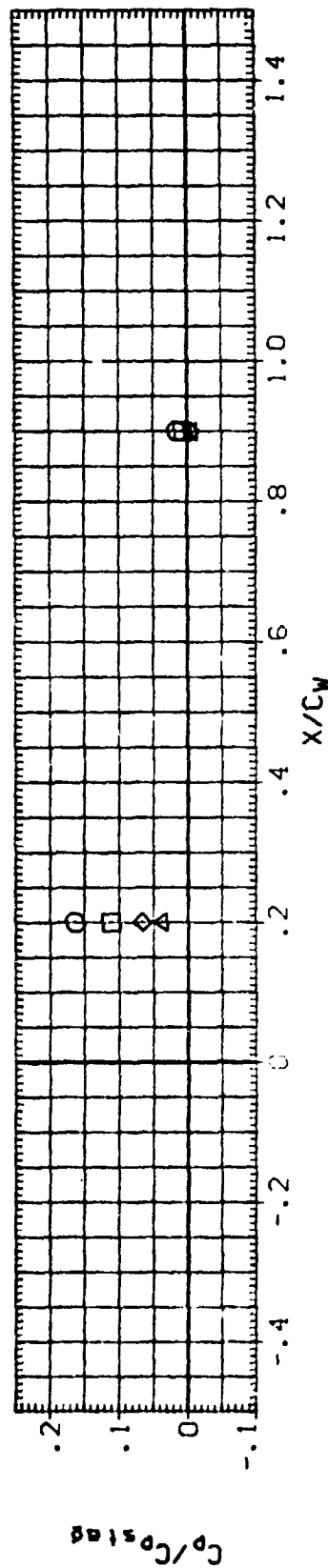
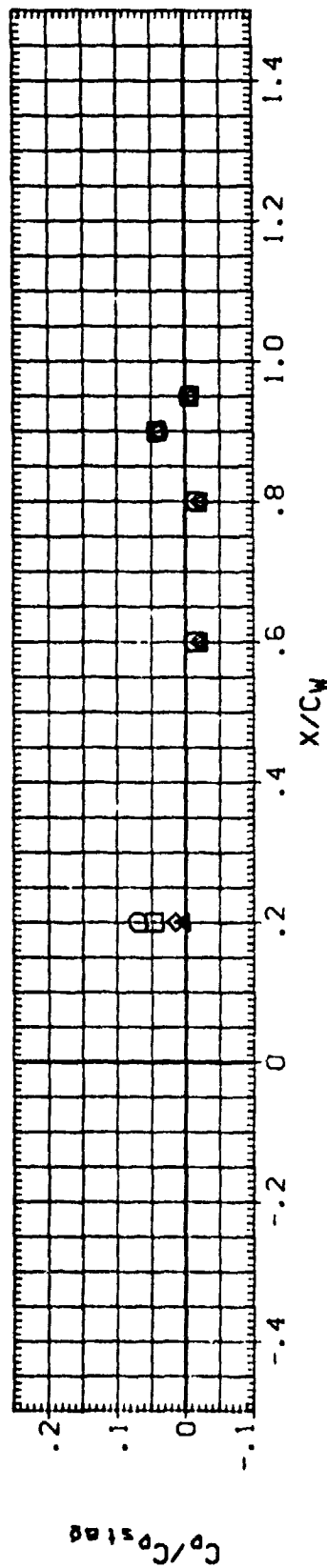
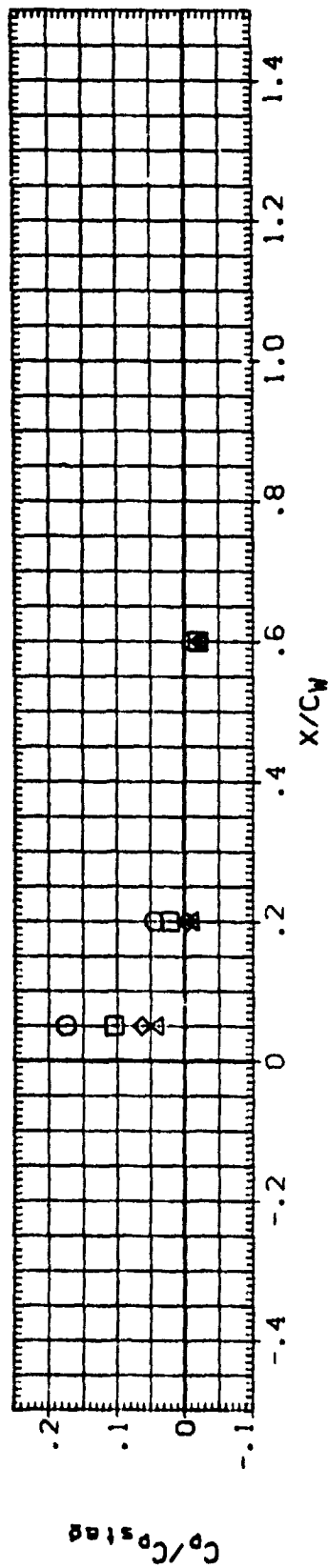


FIG. 36 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, ORBITER UPPER WING. BETA= 0. RN/L= 3.0

(R03VBB) UPWT 1059 (IH4) 01-T22-S8N16 ORB. VERT. TAIL

SYMBOL	ALPHA	Z/BY	MACH	RN/L	PARAMETRIC VALUES	BETA	SCALE
⊗	-10.000	.299	3.700		3.000		.001
⊙	-5.000	.532					
	.000	.765					
	5.000						

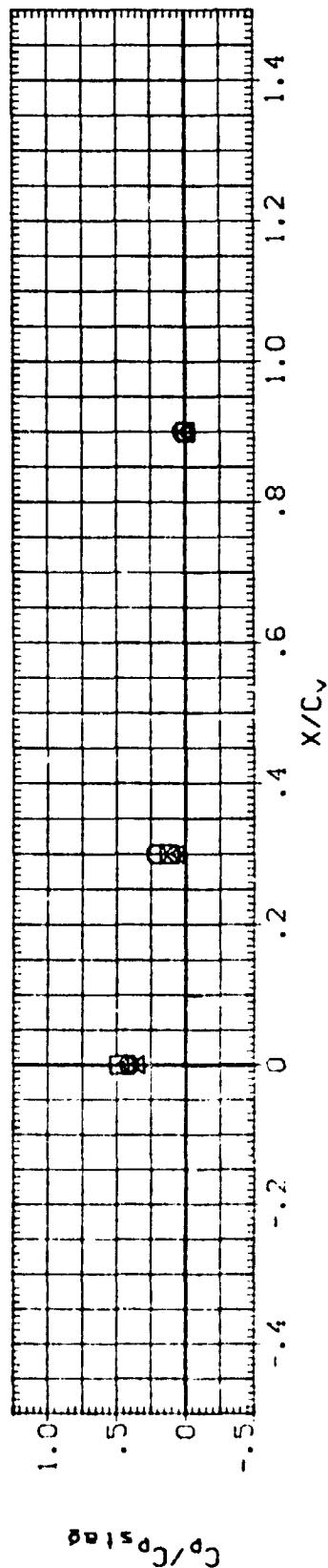
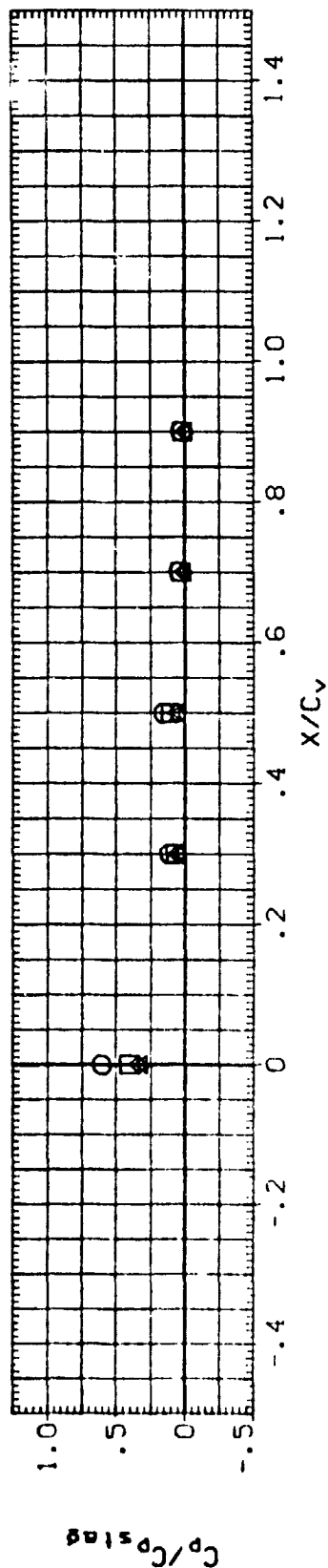
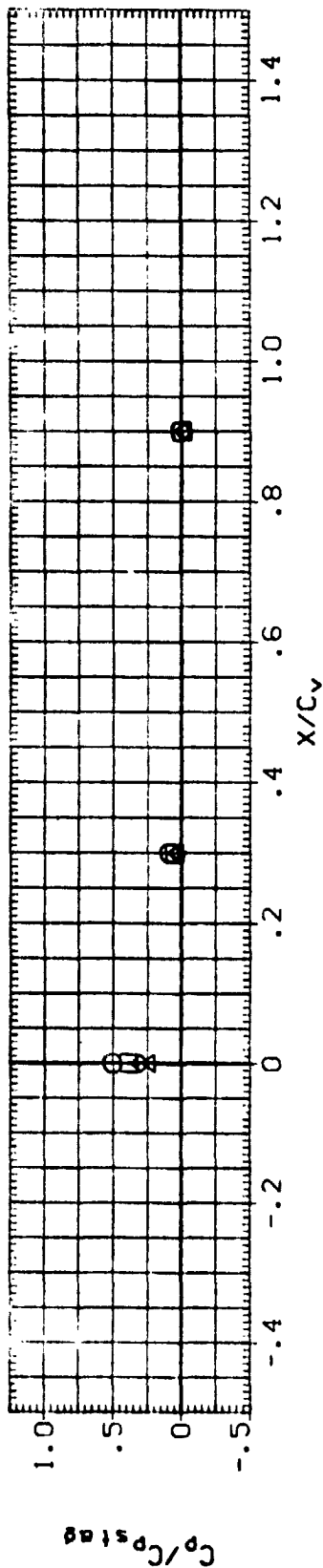


FIG. 37 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. ORBITER VERTICAL TAIL. BETA= 0. RN/L= 3.0

(R03VBB) UPWT 1059 (IH4) 01-T22-S8N16 ORB. VERT. TAIL

SYMBOL ALPHA Z/BV MACH
 -10.000 .299 4.600
 -5.000 .532
 .000 .765
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

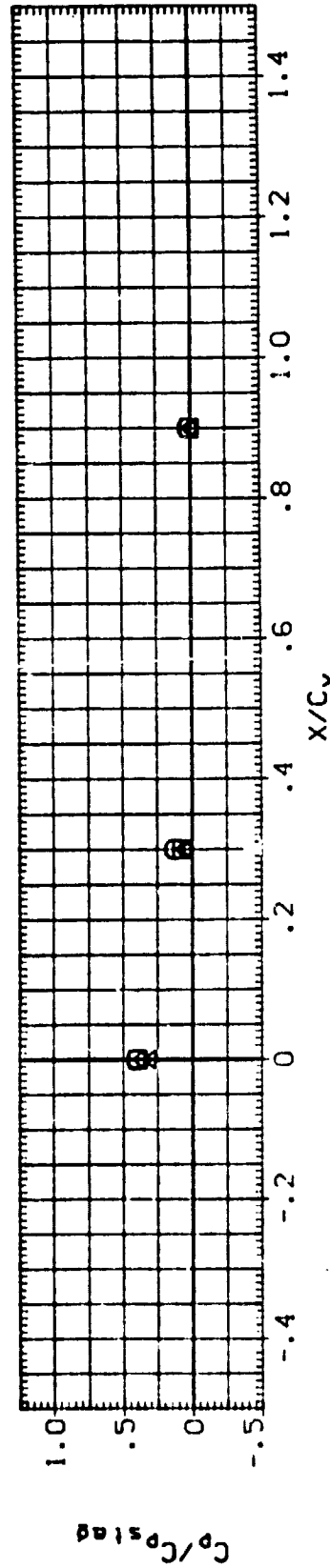
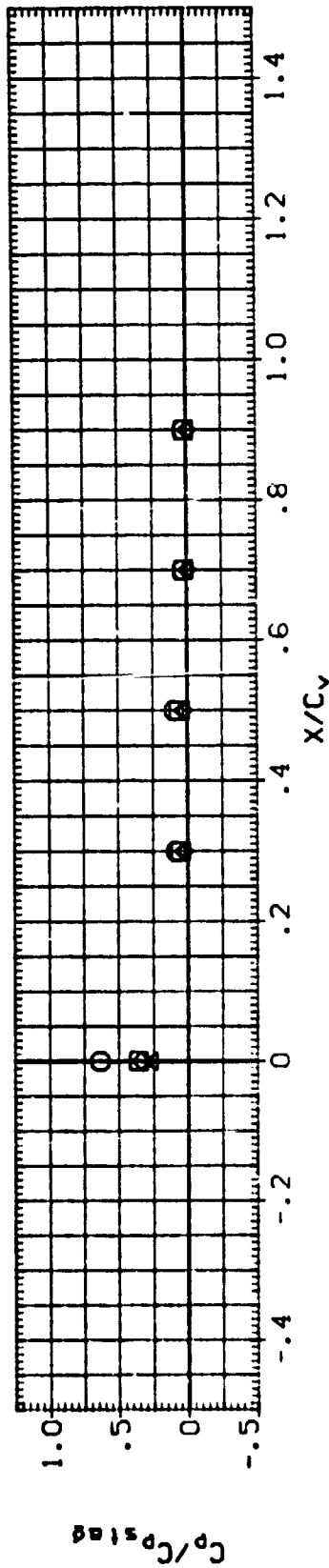
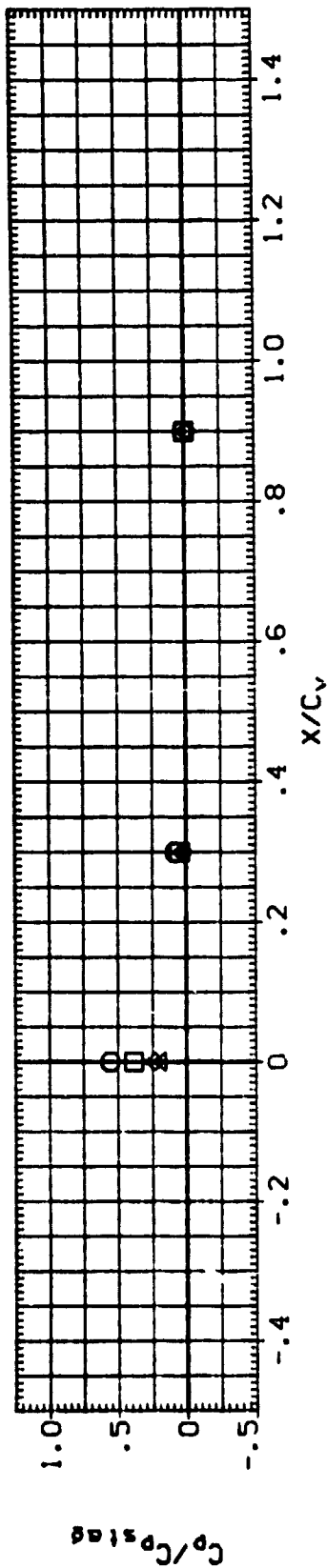


FIG. 37 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, ORBITER VERTICAL TAIL, BETA= 0, RN/L= 3.0

UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
RN/L 3.000 BETA .000

(R031BB) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK
SYMBOL ALPHA THETA MACH
-10.000 67.500 3.700
-5.000 .000
5.000

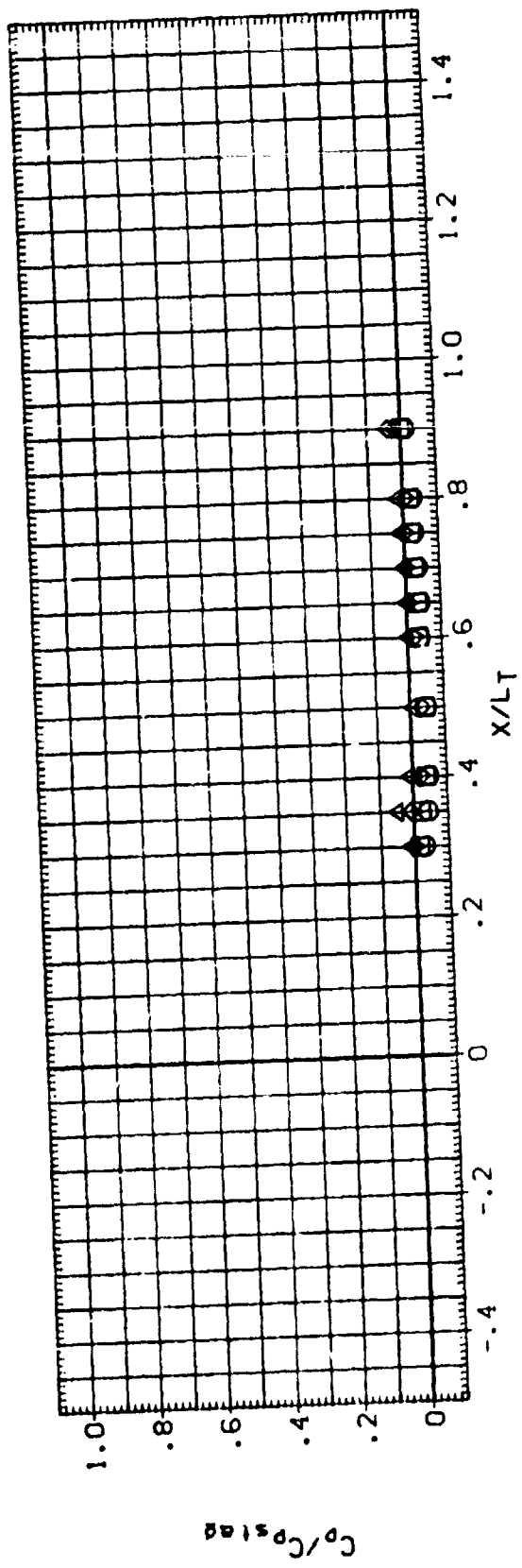
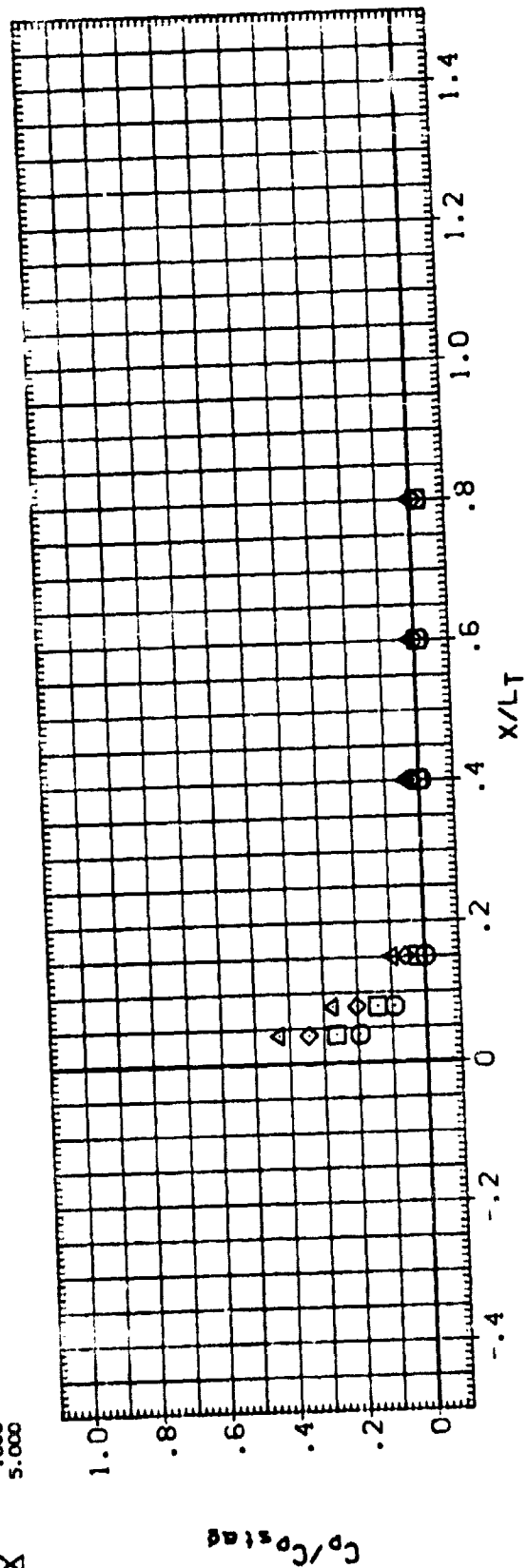


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
BETA= 0. RN/L= 3.0

(R03TB8) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	RN/L	PARAMETRIC VALUES
□	-10.000	112.500	3.700	3.000	BETA
□	-5.000	90.000			.000
□	.000				
□	5.000				

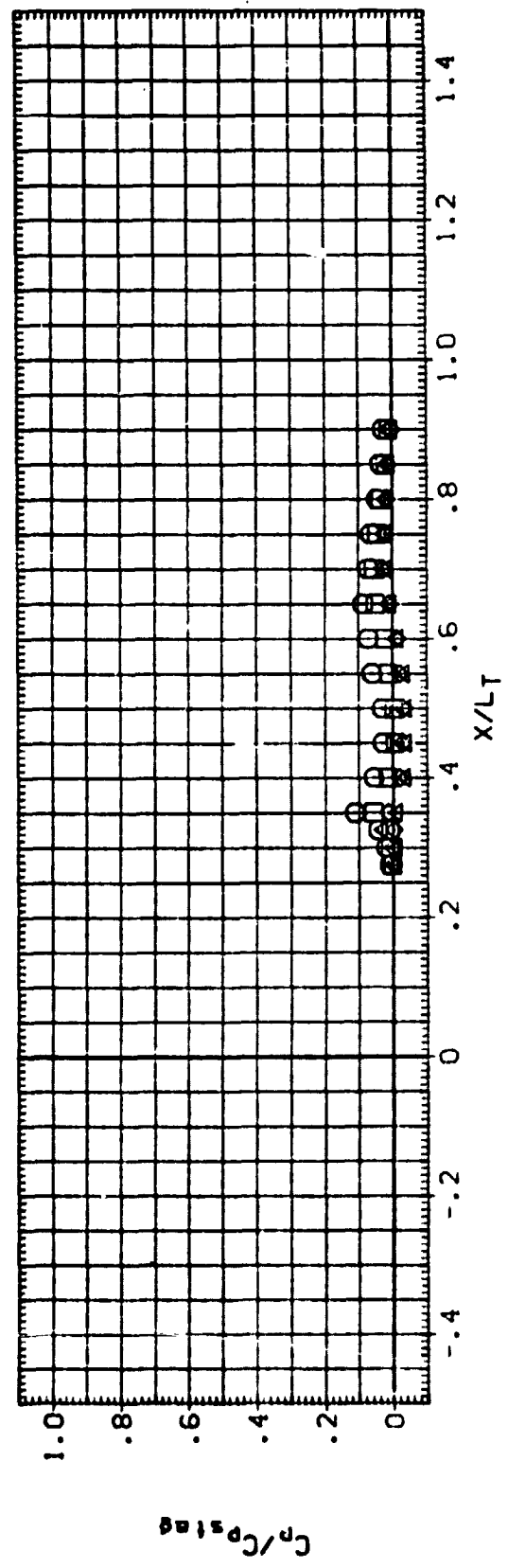
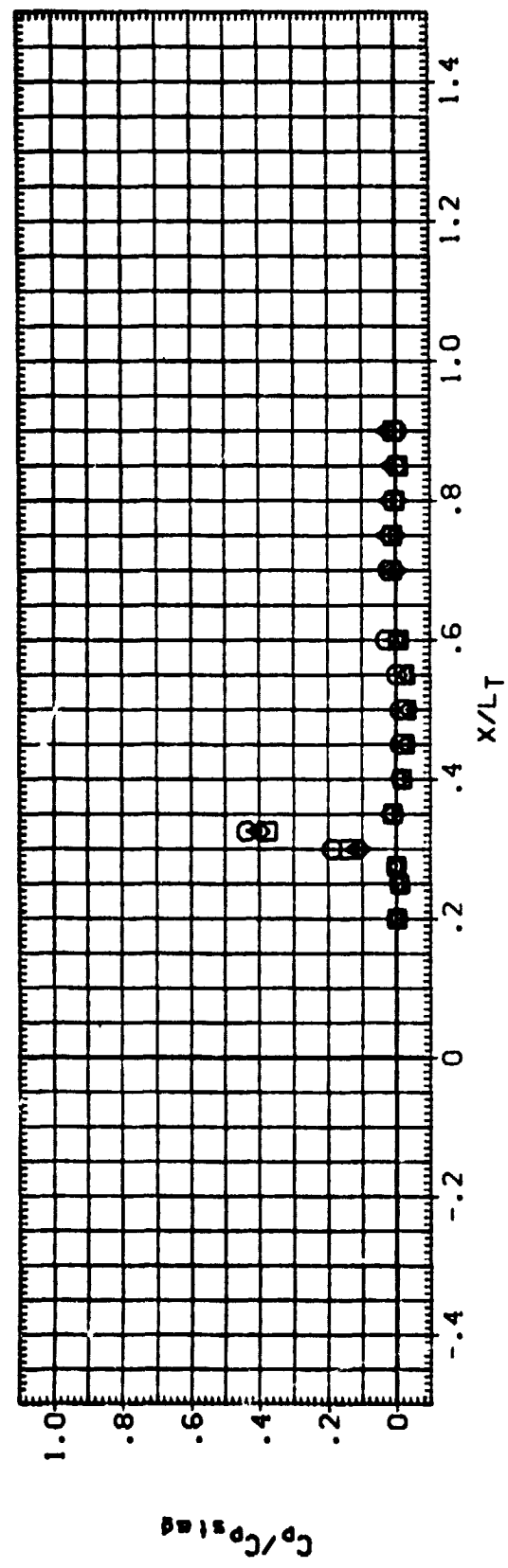


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
BETA= 0. RN/L= 3.0

(R03TBB) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH

-10.000 135.000 3.700
-5.000 123.000
-0.000
5.000

PARAMETRIC VALUES
RN/L 3.000 BETA .000

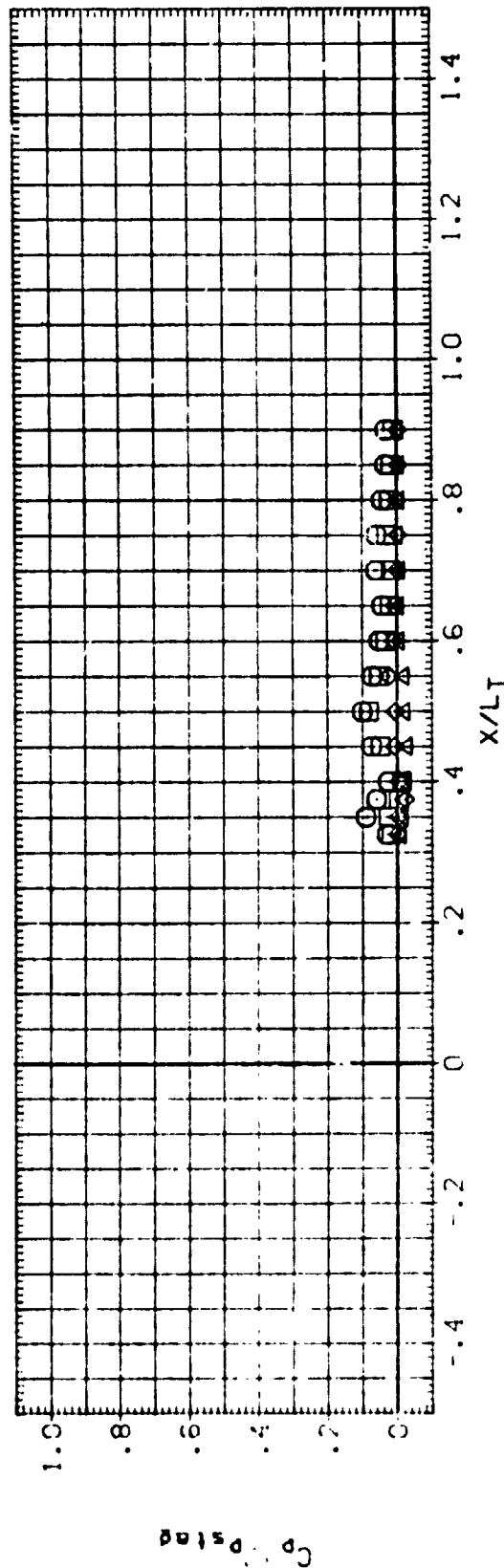
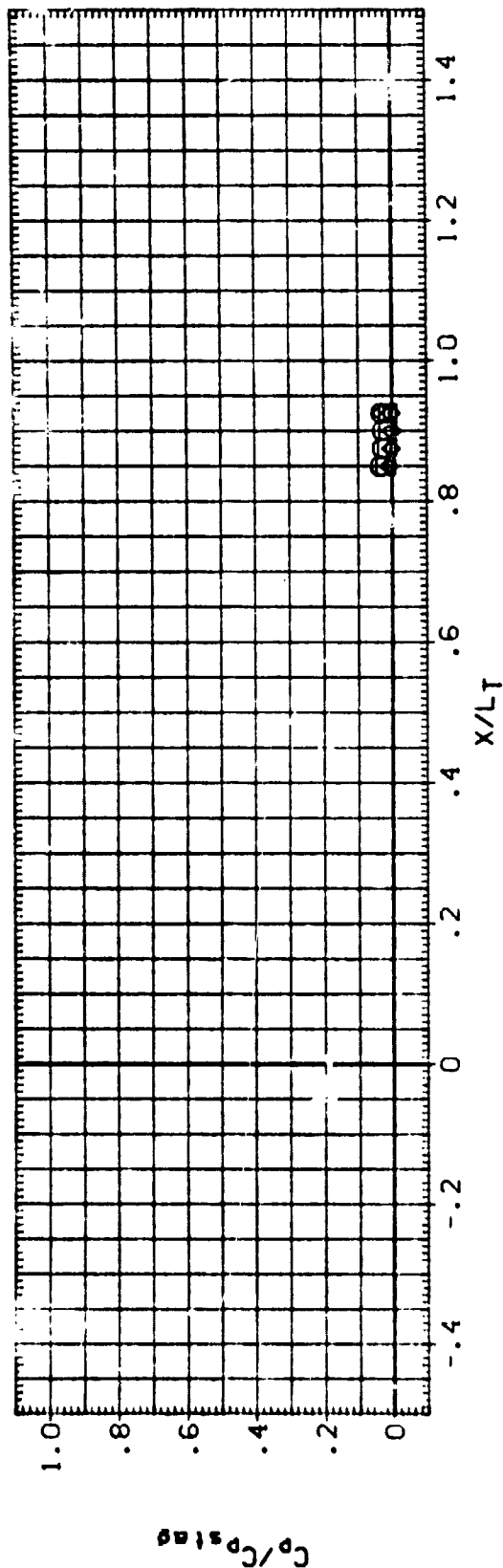


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
BETA= 0. RN/L= 3.0

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(R03TB8) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA
 X O -10.000
 X O -5.000
 X O .000
 X O 5.000

THETA
 180.000
 157.500

RN/L

PARAMETRIC VALUES
 3.000 BETA .000

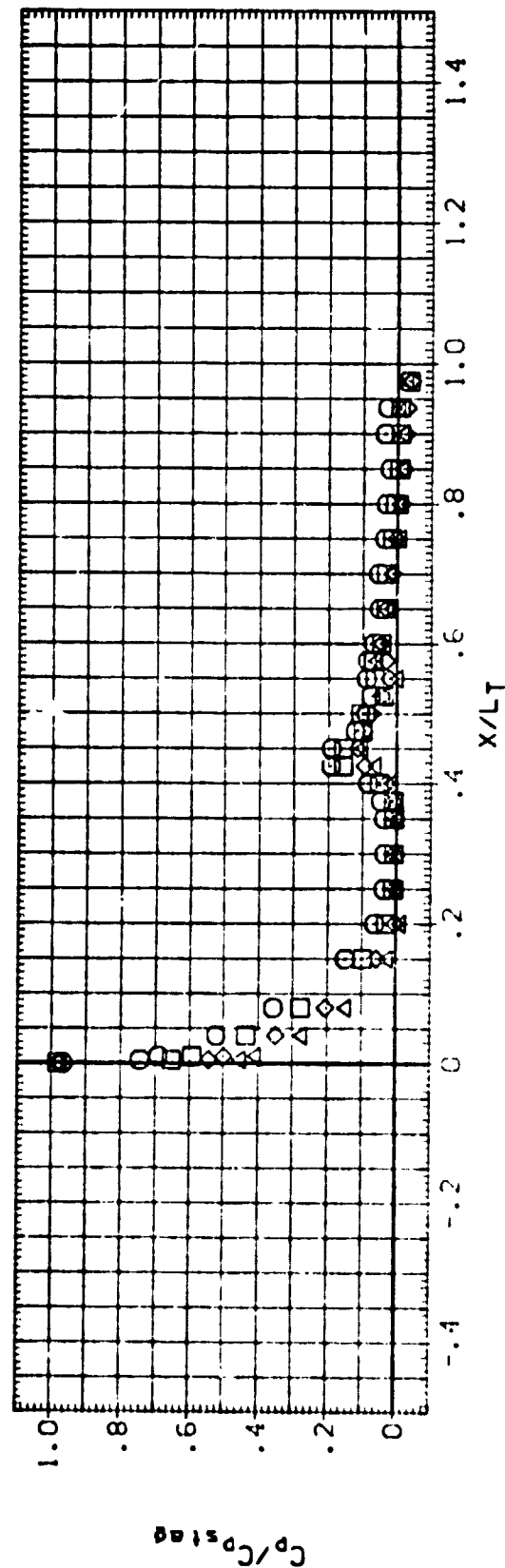
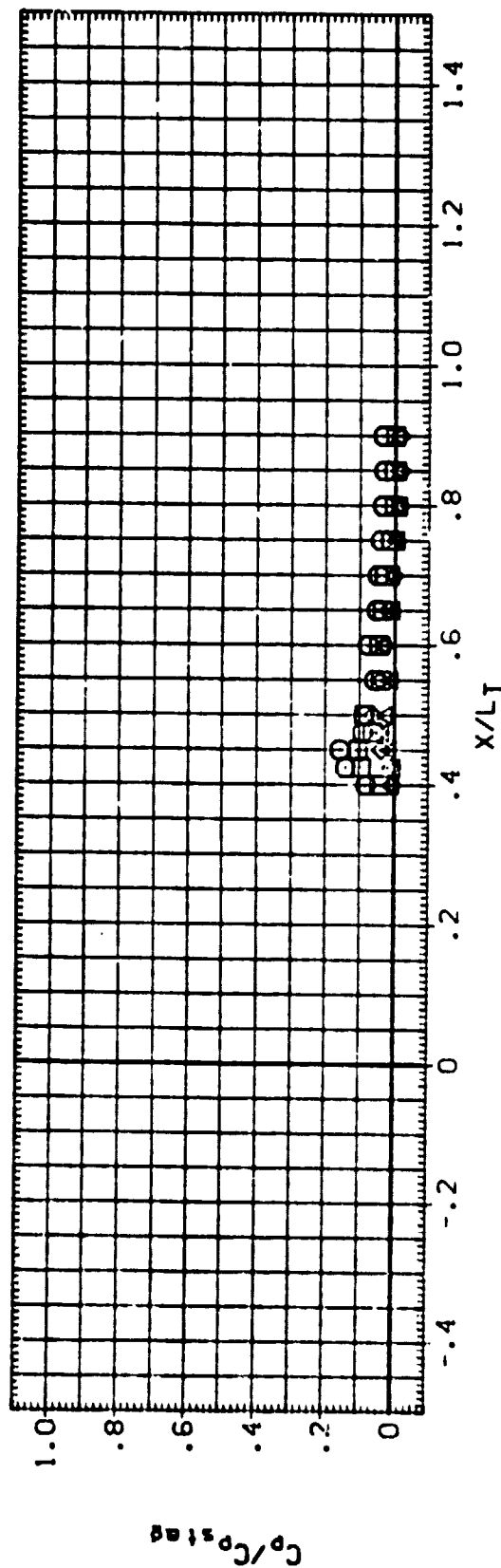


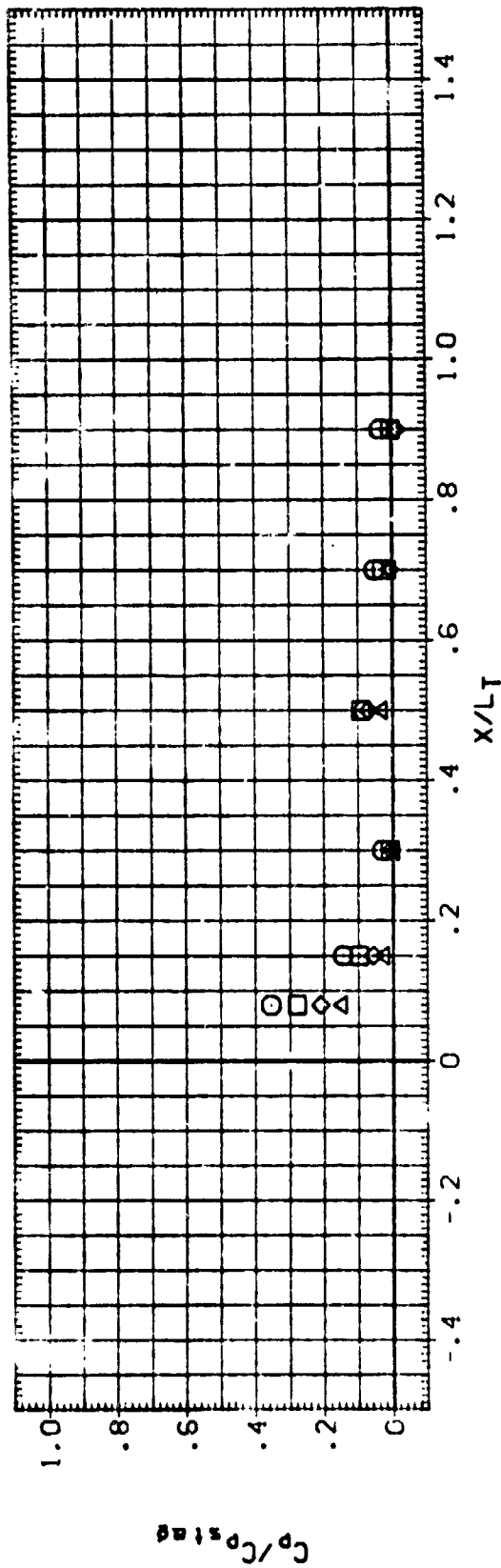
FIG. 38 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK. BETA= 0. RN/L= 3.0

[R03TB8] UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -10.000 210.000 3.700
 -5.000 197.000
 .000
 5.000

PARAMETRIC VALUES

RN/L . 3.000 BETA .000



REPRODUCIBILITY OF THE
 ORIGINAL PAGE IS POOR

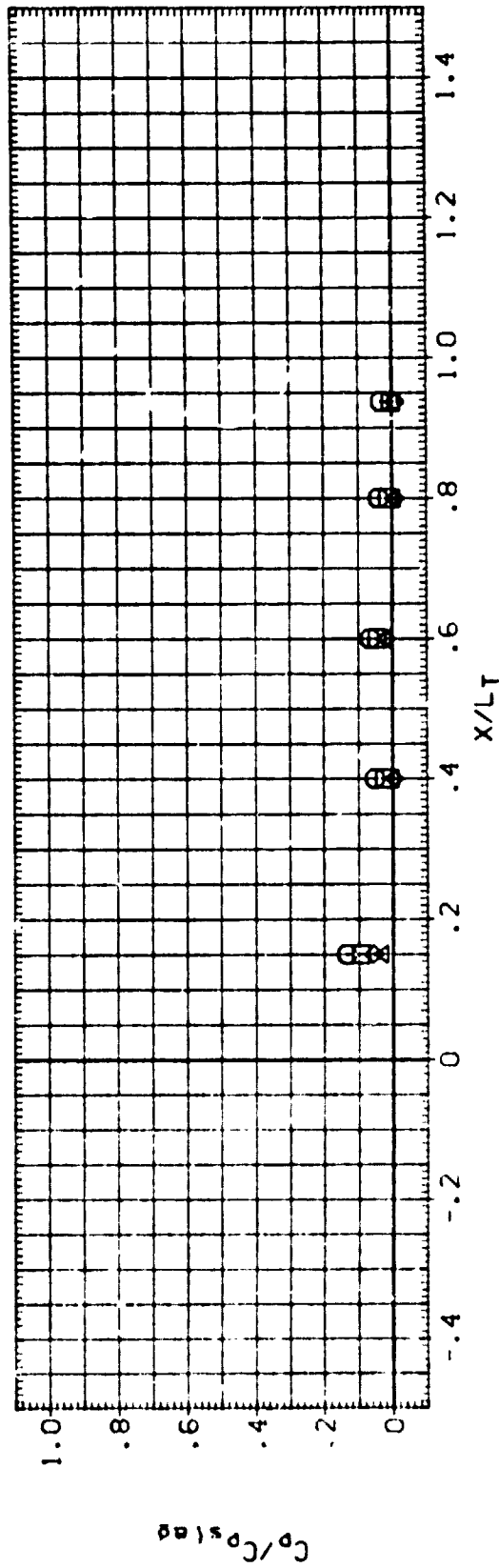


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
 BETA= 0. RN/L= 3.0

(R03TB8) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA
 -10.000
 -5.000
 .000
 5.000

THETA MACH
 67.500 4.600
 .000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

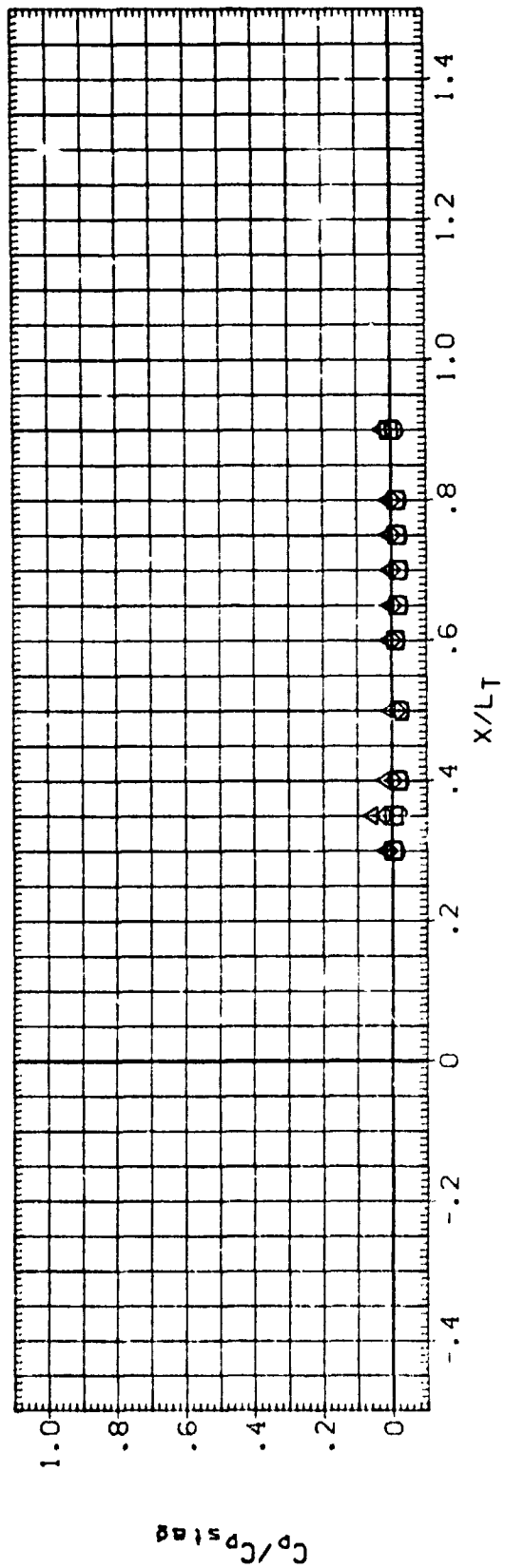
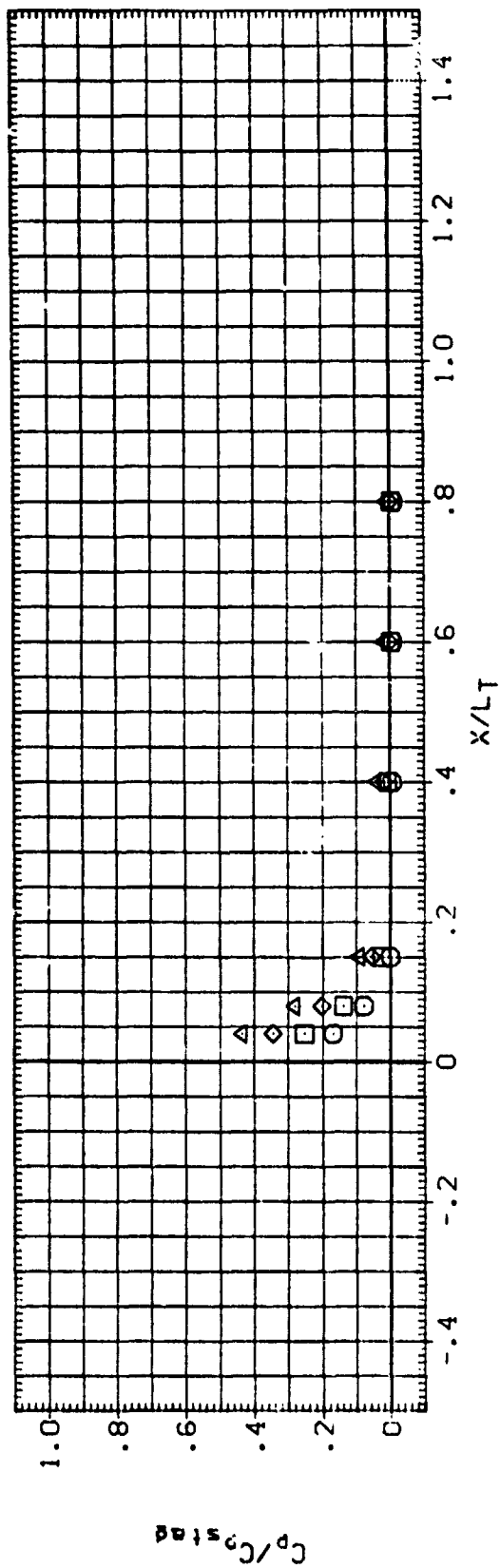


FIG. 38 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22, EXTERNAL TANK.
 $\beta = 0.0$, $RN/L = 3.0$

(R03TBB) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA THETA MACH
 -10.000 112.500 4.600
 -5.000 50.000
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA .000

RN/L

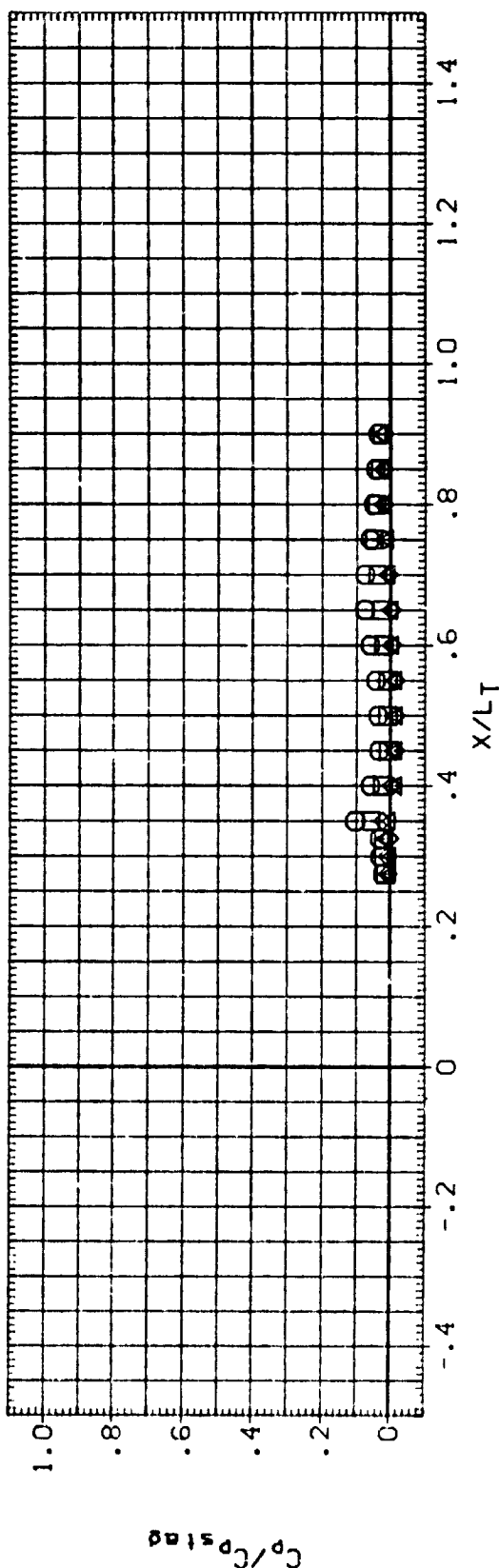
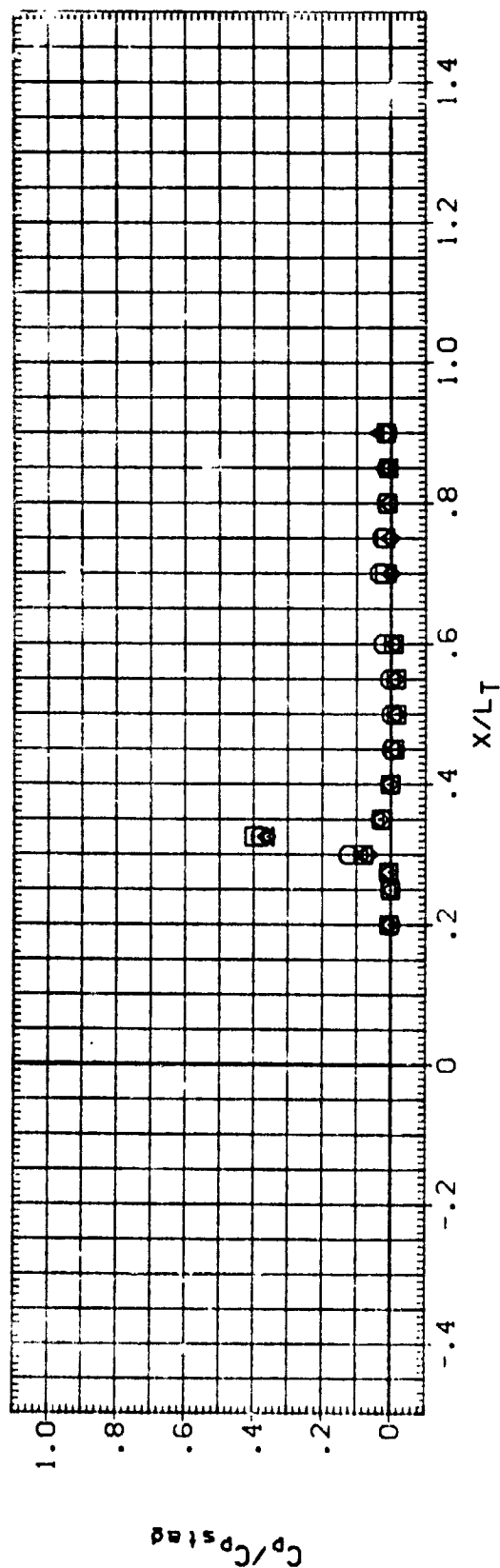


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
 BETA= 0, RN/L= 3.0



(R03TB8) UPWT 1059 (IH4) 01-722-S8N16 EXTERNAL TANK

SYMBOL	ALPHA	THETA	MACH	DATA	PARAMETRIC VALUES
○	-10.000	135.000	4.600	3.000	BETA
×	-5.000	123.000			
◇	.000				
△	5.000				

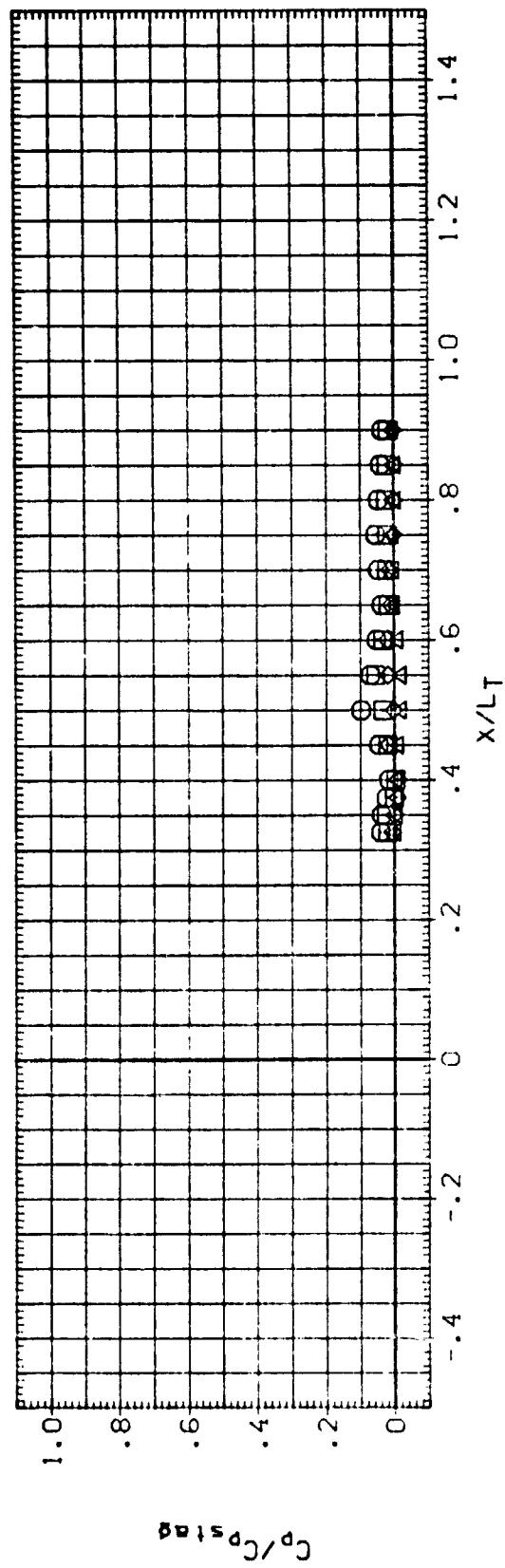
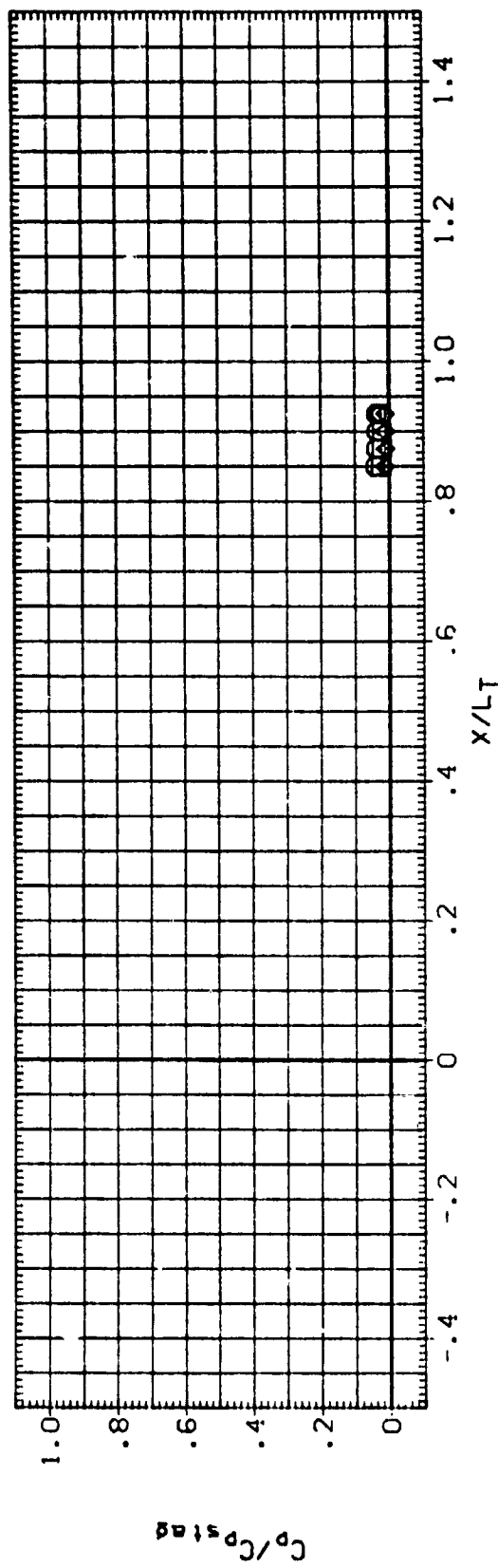


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, EXTERNAL TANK. BETA= 0, RN/L= 3.0

UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH 4.600

THETA 180.000

ALPHA -10.000

SYMBOL

157.500

-5.000

5.000

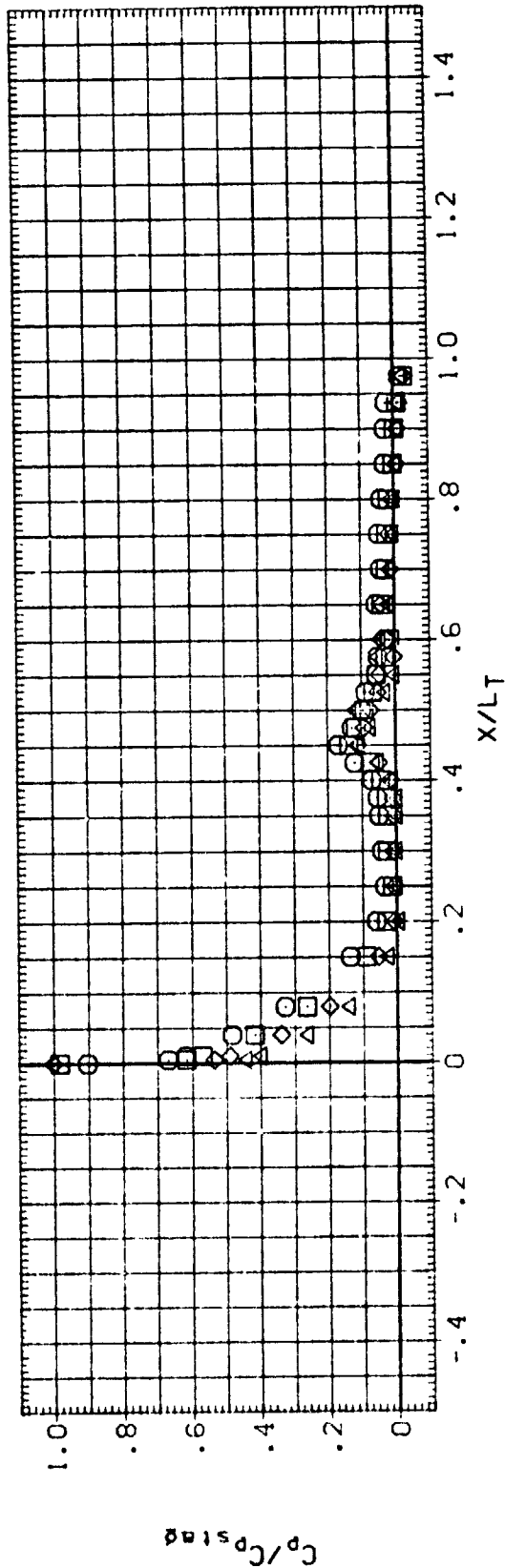
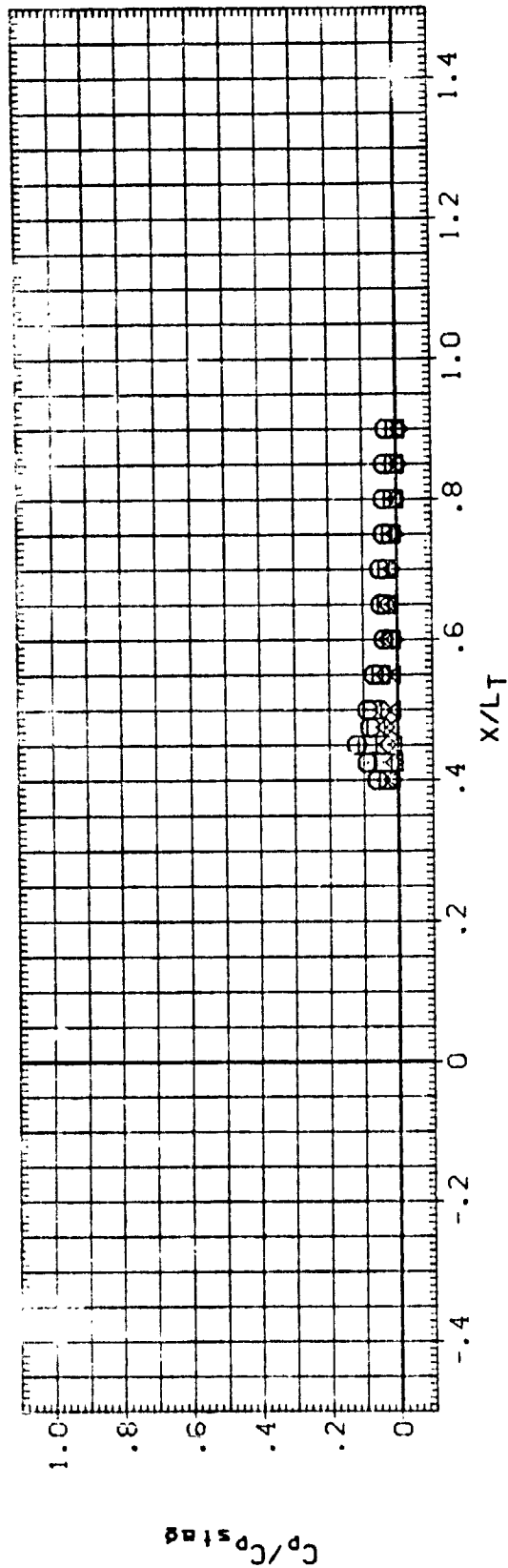


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, EXTERNAL TANK.
BETA= 0, RN/L= 3.0

(RQ3TBB) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA BETA MACH
 -10.000 2.0.000 4.500
 -5.000 1.27.000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

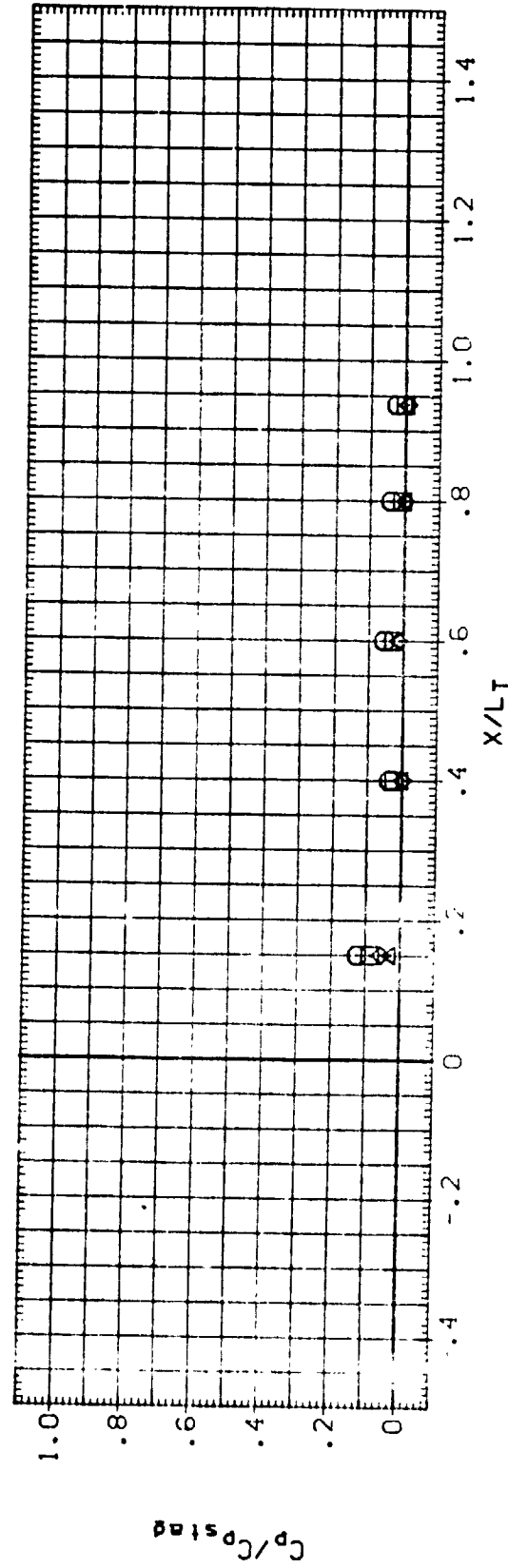
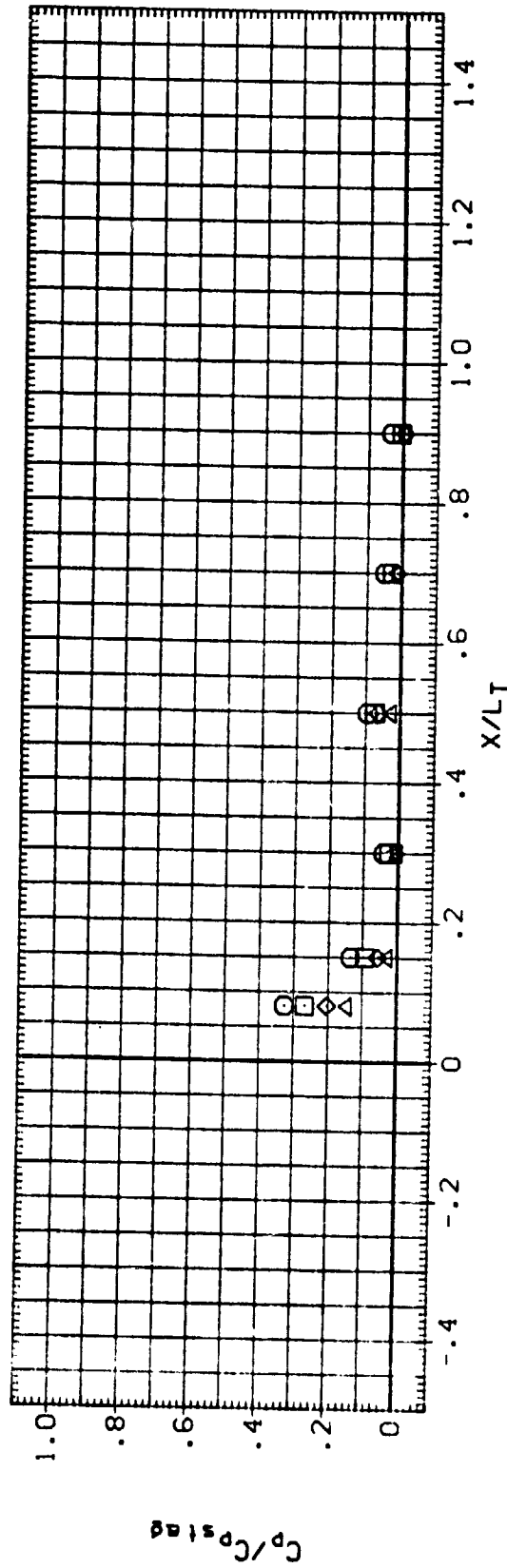


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, EXTERNAL TANK. BETA= 0. RN/L= 3.0

(R03TBB) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA
-10.000
-5.000
0.000
5.000

X/LT MACH
.350 3.700
.300

PARAMETRIC VALUES
RN/L 3.000 BETA .000

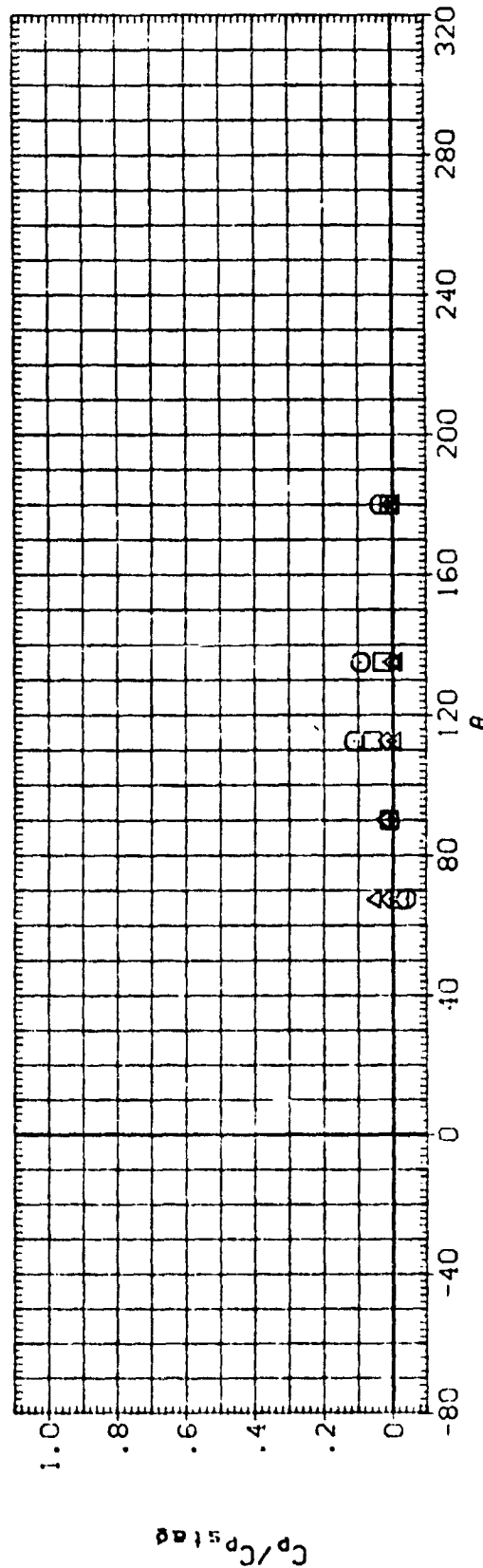
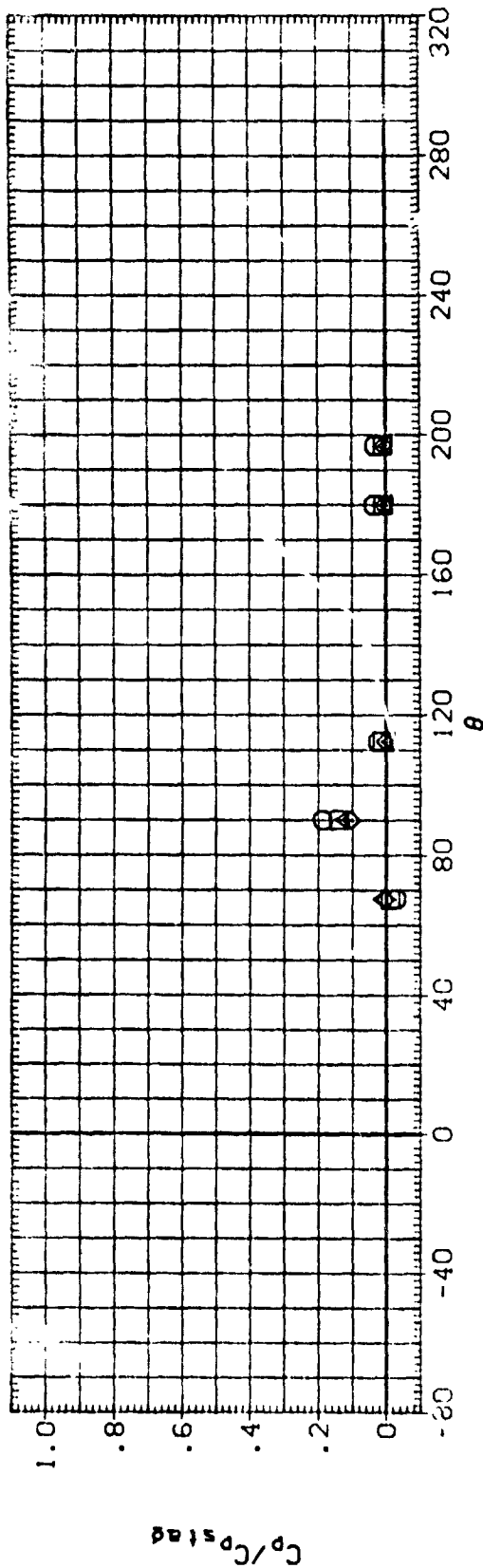


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
BETA= 0. RN/L= 3.0

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(RQ3TB8) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -10.000
 -5.000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

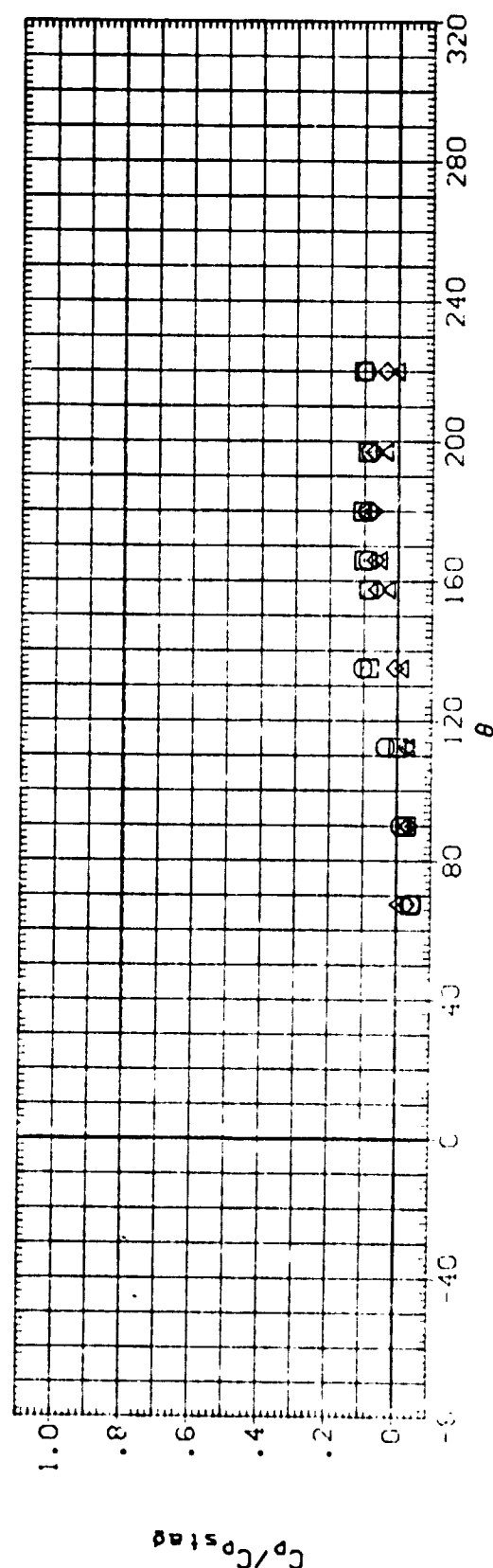
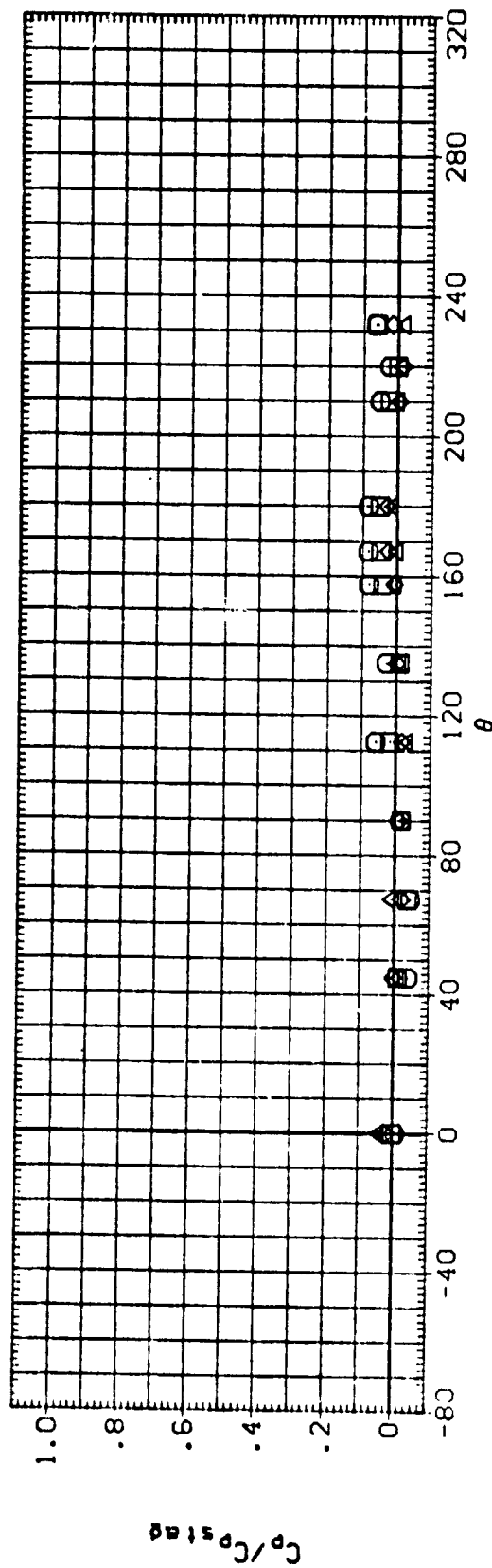


FIG. 38 VARIATION OF CP/CPs ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK, BETA= 0. RN/L= 3.0

(RQ3TB6) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH 3.700

SYMBOL ALPHA X/LT
-10.000
-5.000
0.000
5.000

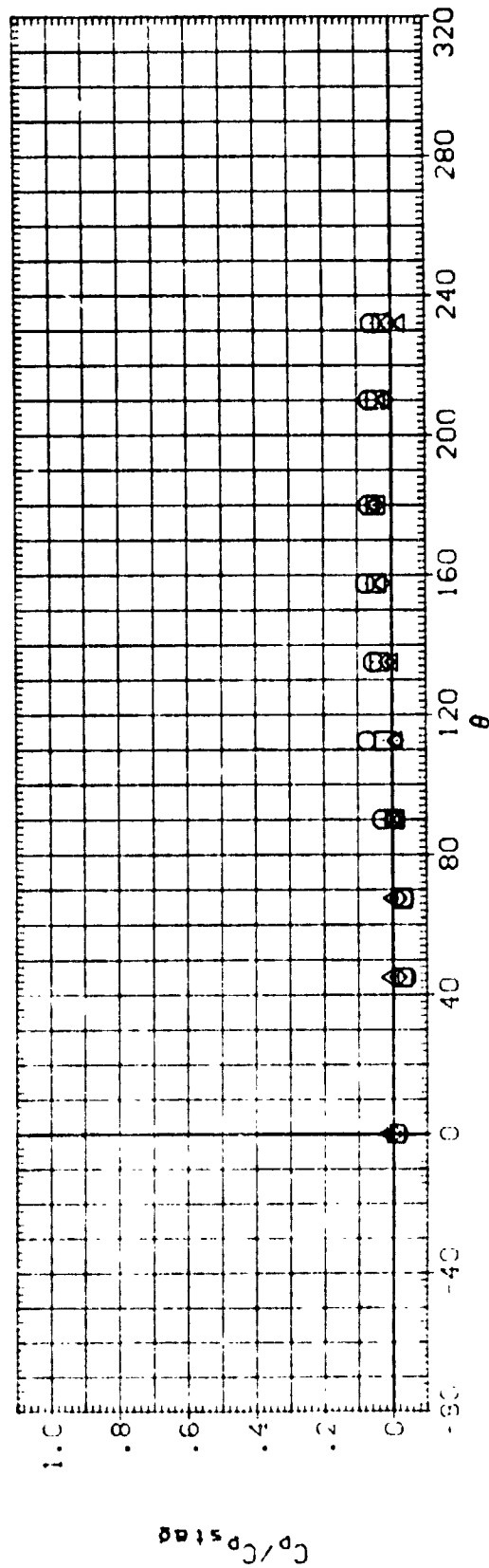
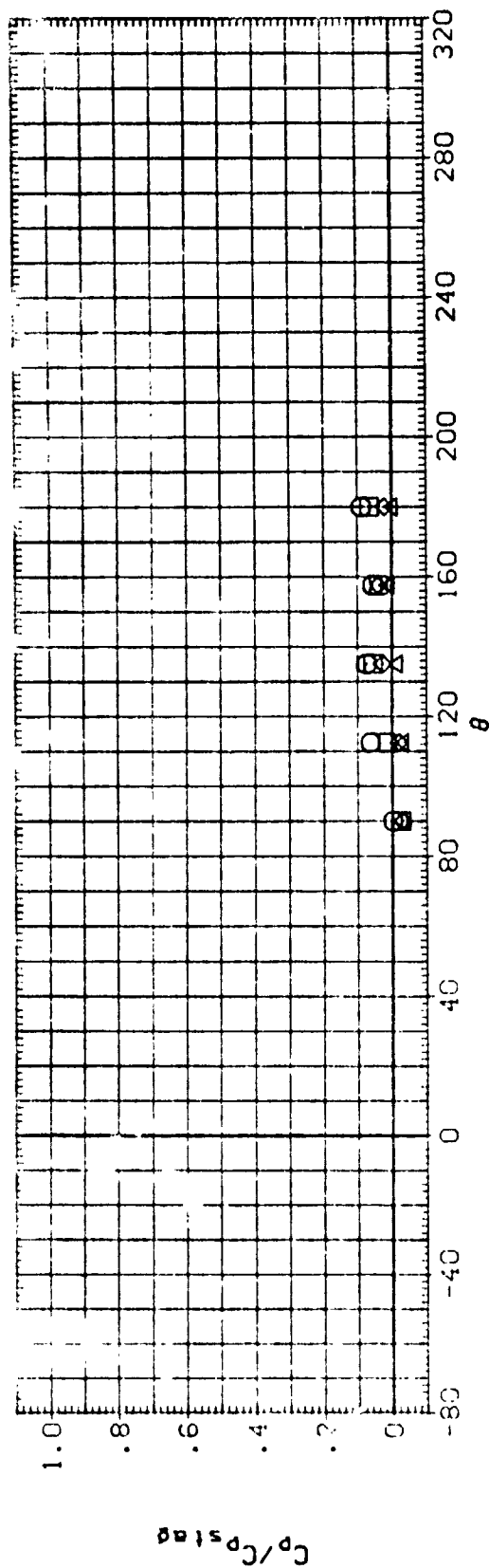


FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
BETA= 0. RN/L= 3.0



(RQ318B) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
-10.000
-5.000
-1.000
5.000

.700
.650
3.700

PARAMETRIC VALUES
RN/L 3.000 BETA .000

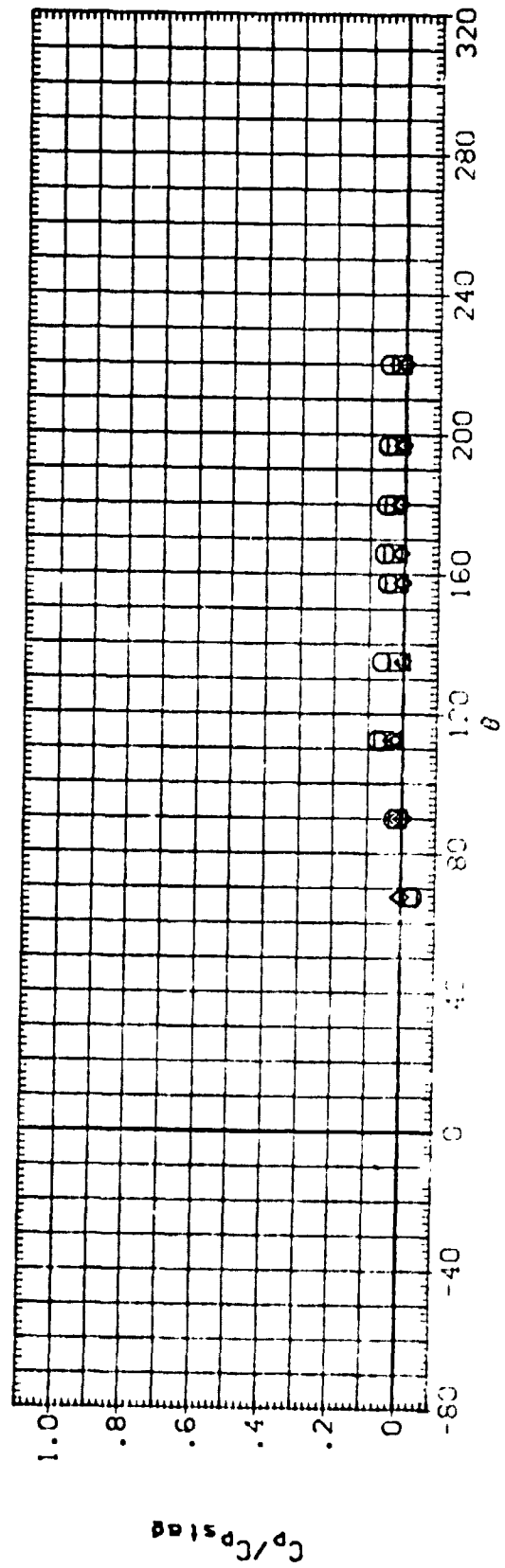
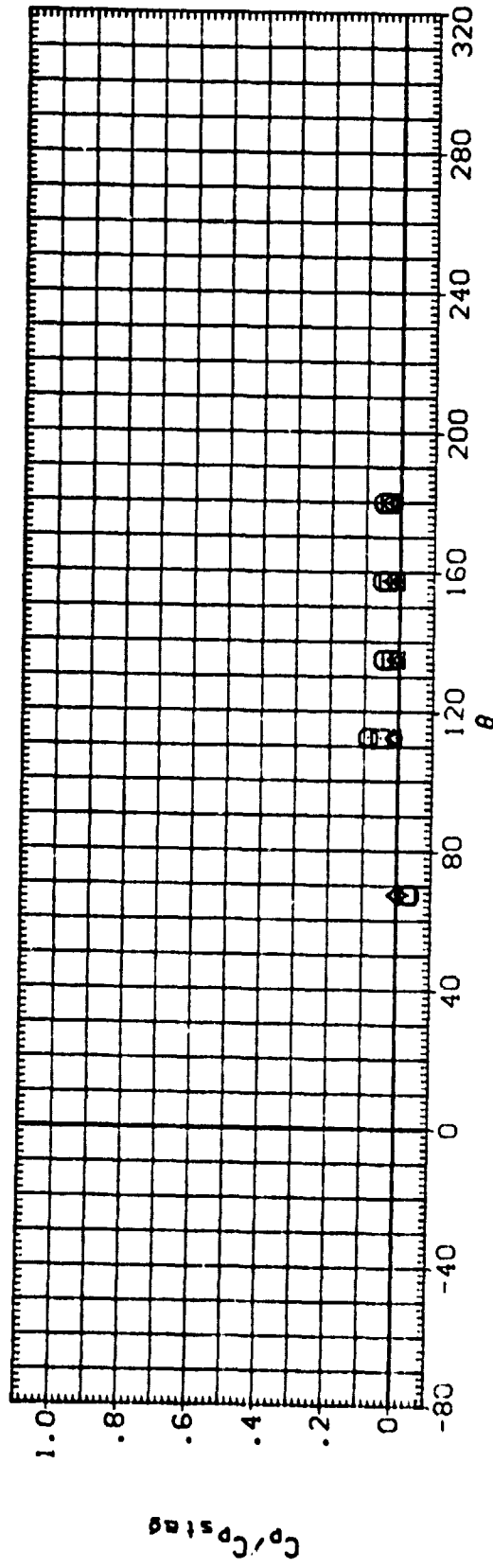


FIG. 38 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
BETA= 0. RN/L= 3.0

(R0318B) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA
 X -10.000
 X -5.000
 X -0.000
 X 5.000

K/L T MAC
 .800 3.700
 .750

PARAMETRIC VALUES
 3.000 BETA .00

RN/L

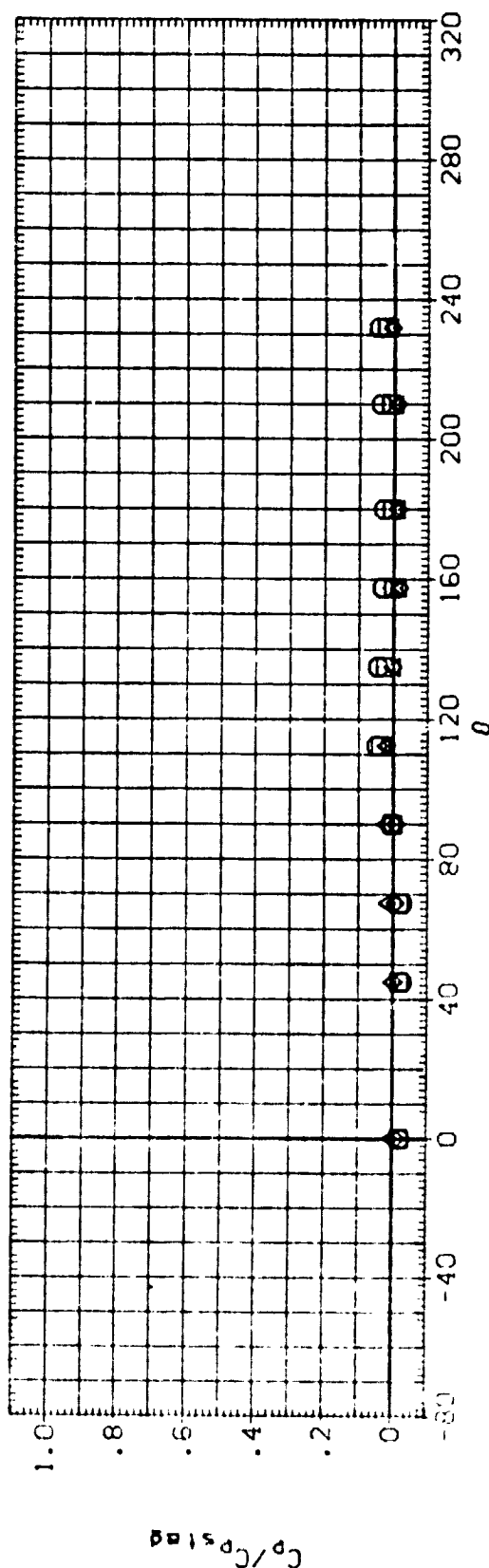
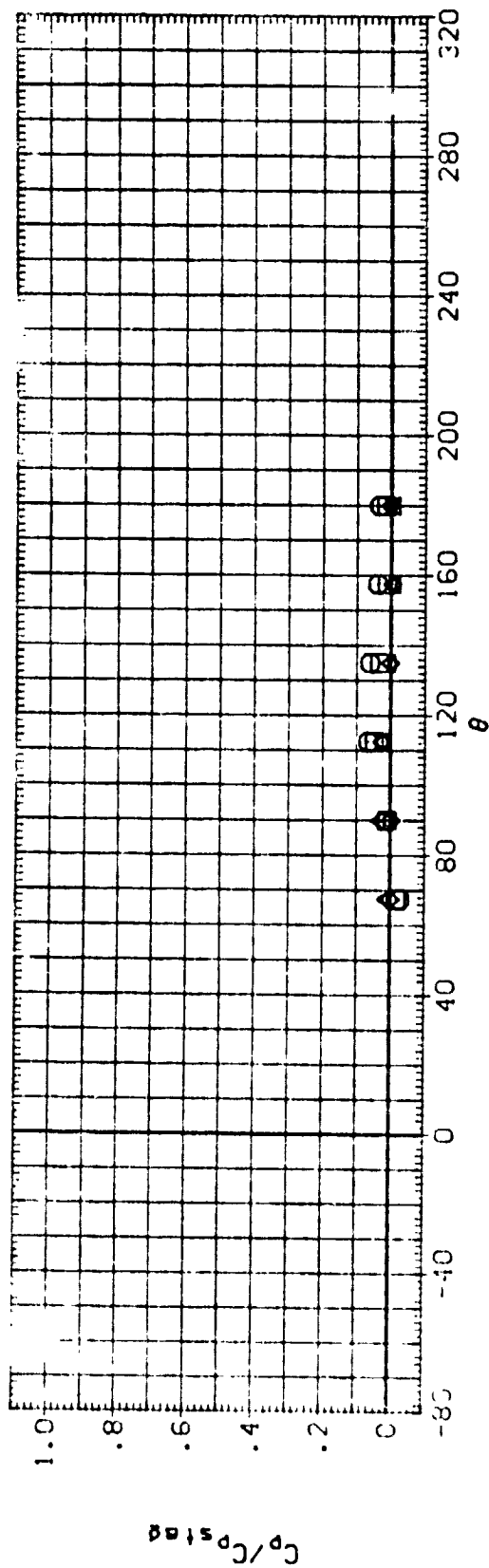


FIG. 38 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
 BETA = 0. RN/L = 3.0

[R03TBB] UWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT MACH
 -10.000
 -5.000
 .000
 5.000

.900
 .850
 3.700

PARAMETRIC VALUES
 3.000 BETA

RN/L

.000

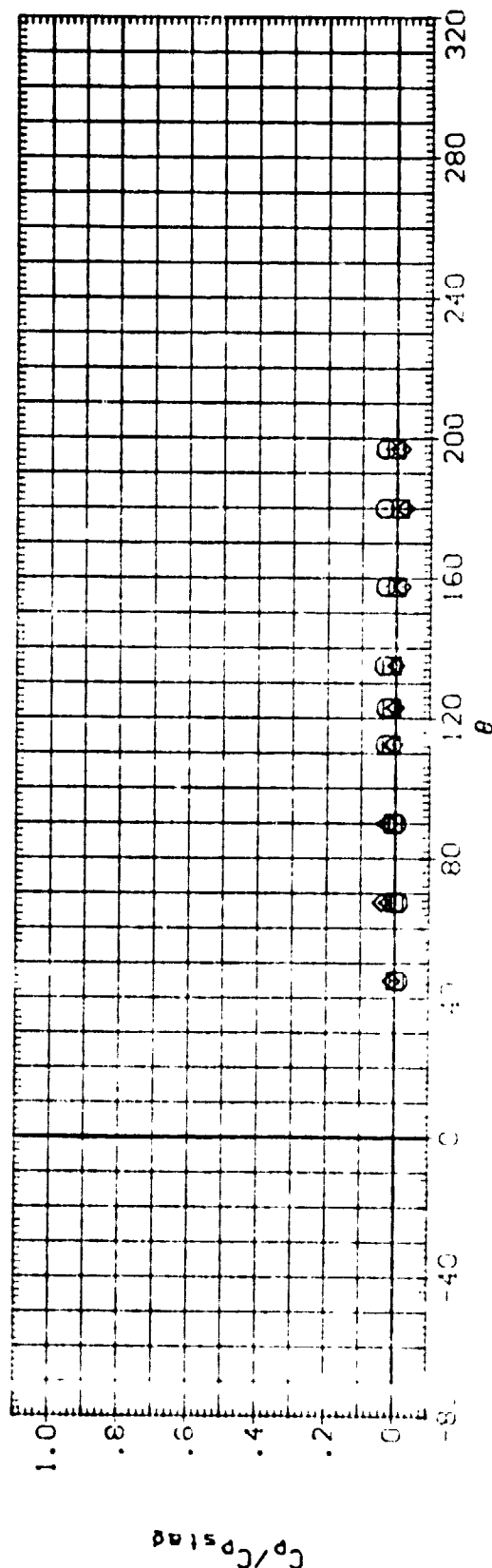
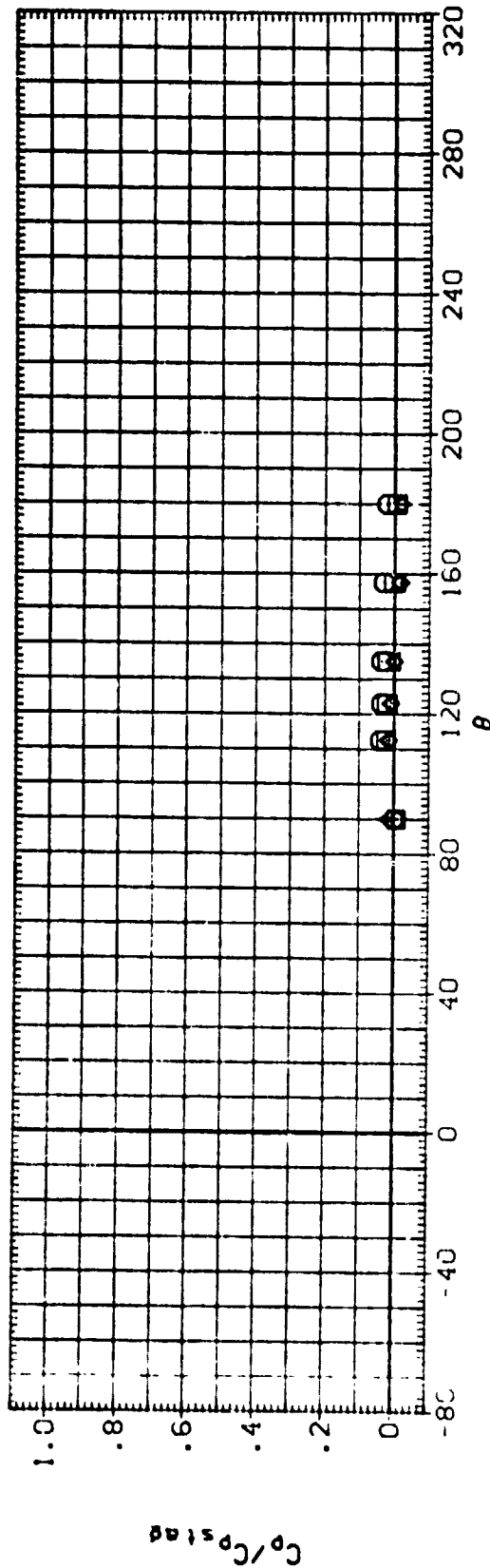


FIG 38 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
 BETA = 0. RN/L = 3.0

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(R03188) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

ALPHA
X/LT
MACH
4.600
-10.000
-5.000
-1.000
5.000

PARAMETRIC VALUES
3.000 BETA
RN/L
.00

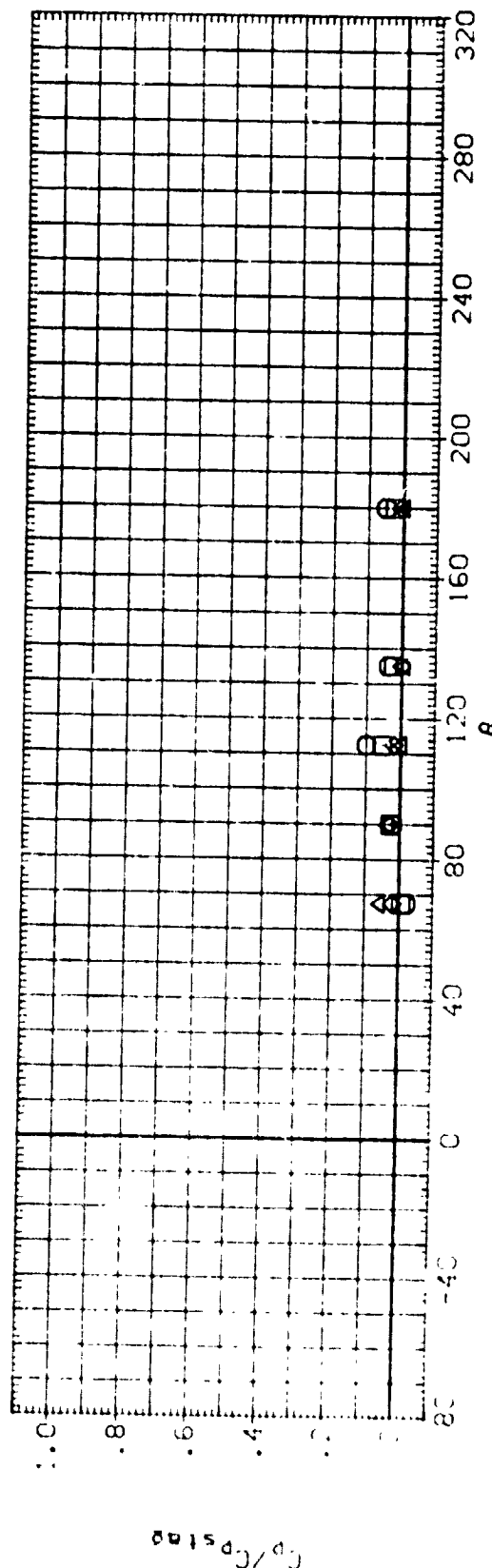
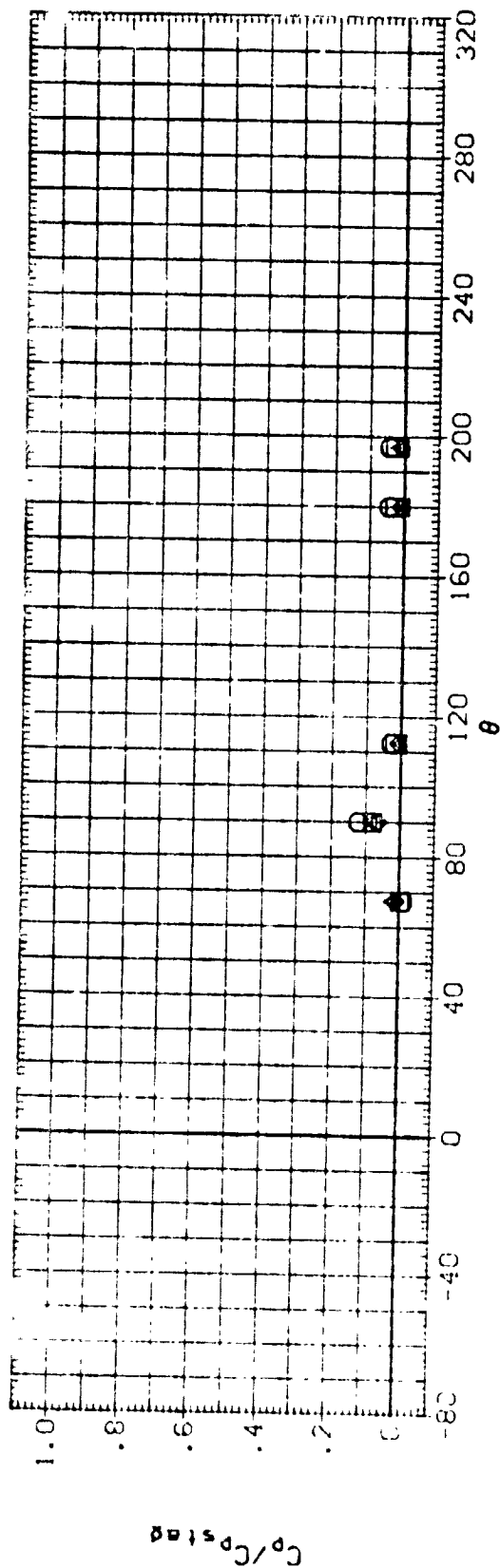


FIG. 38 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22, EXTERNAL TANK.
BETA= 0, RN/L= 3.0

(R031BB) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA
 -10.000
 -5.000
 -0.000
 5.000

X/L
 .500
 .400

MACH
 4.600

PN/L
 3.000
 BETA
 .000

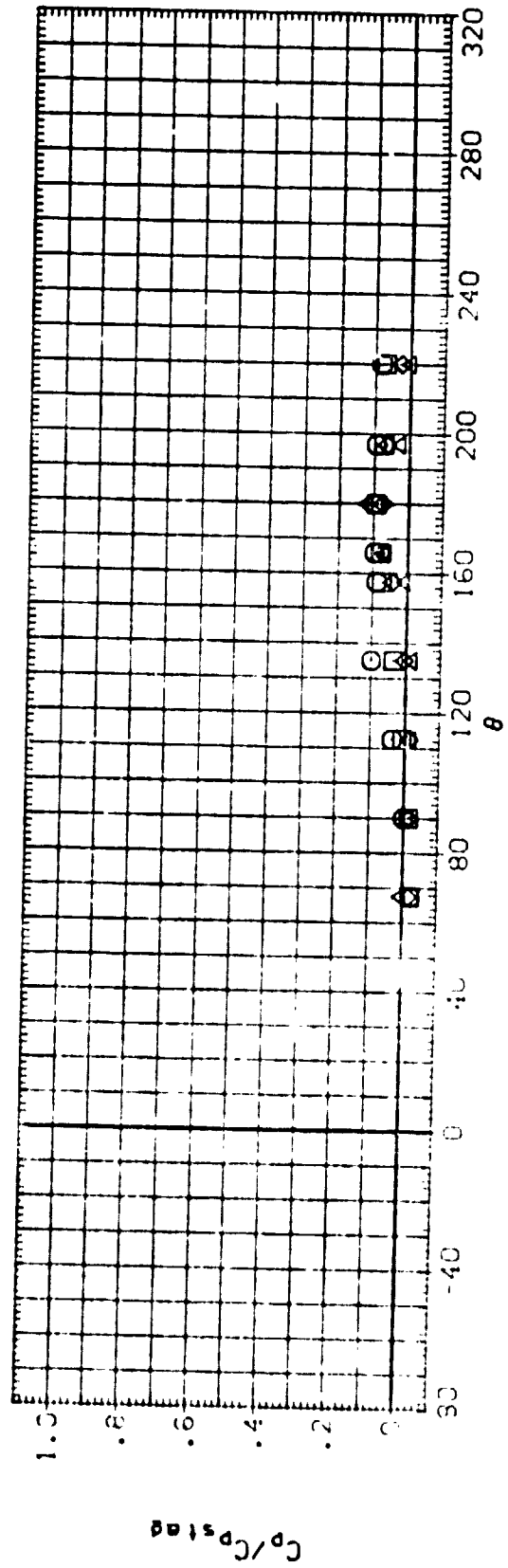
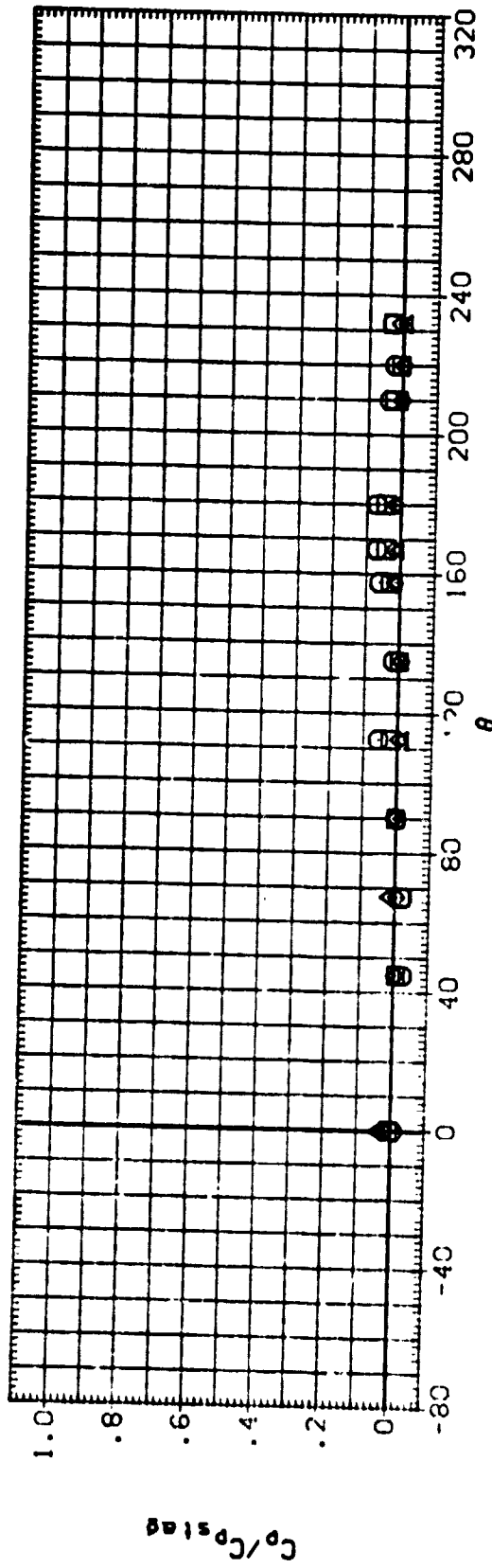


FIG. 38 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
 BETA = 0. RN/L = 3.0

(R03188) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
RN/L 3.000 BETA .000

SV953L A-PWA X/LT MACH
-10.000 .600 4.600
-5.000 .550
.000
5.000

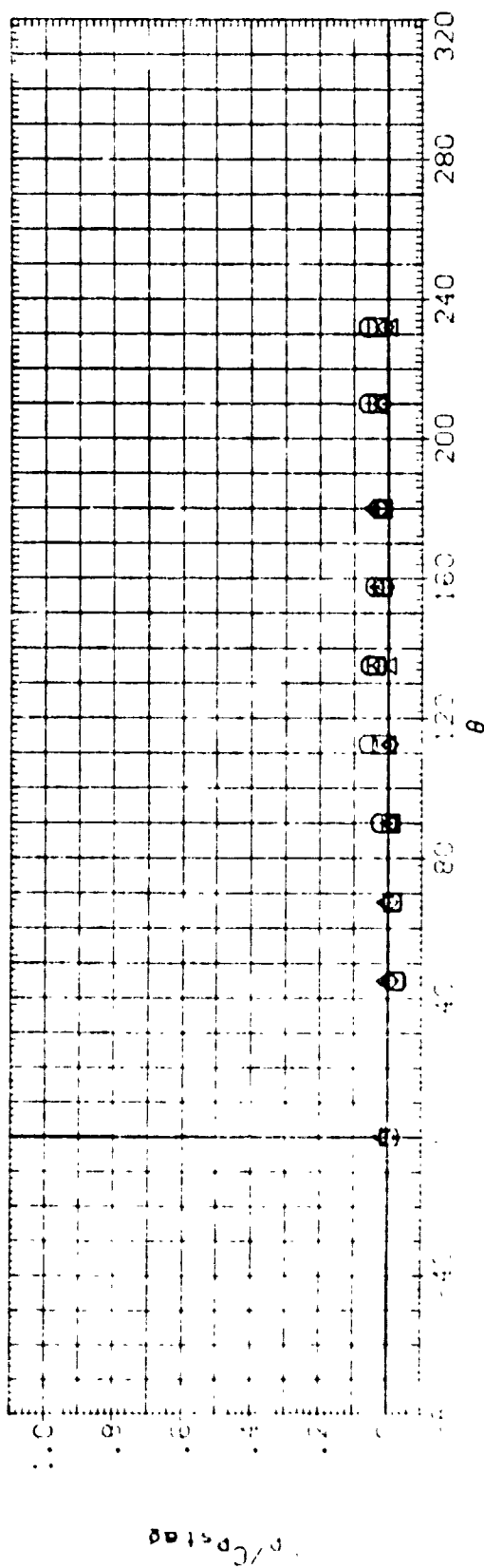
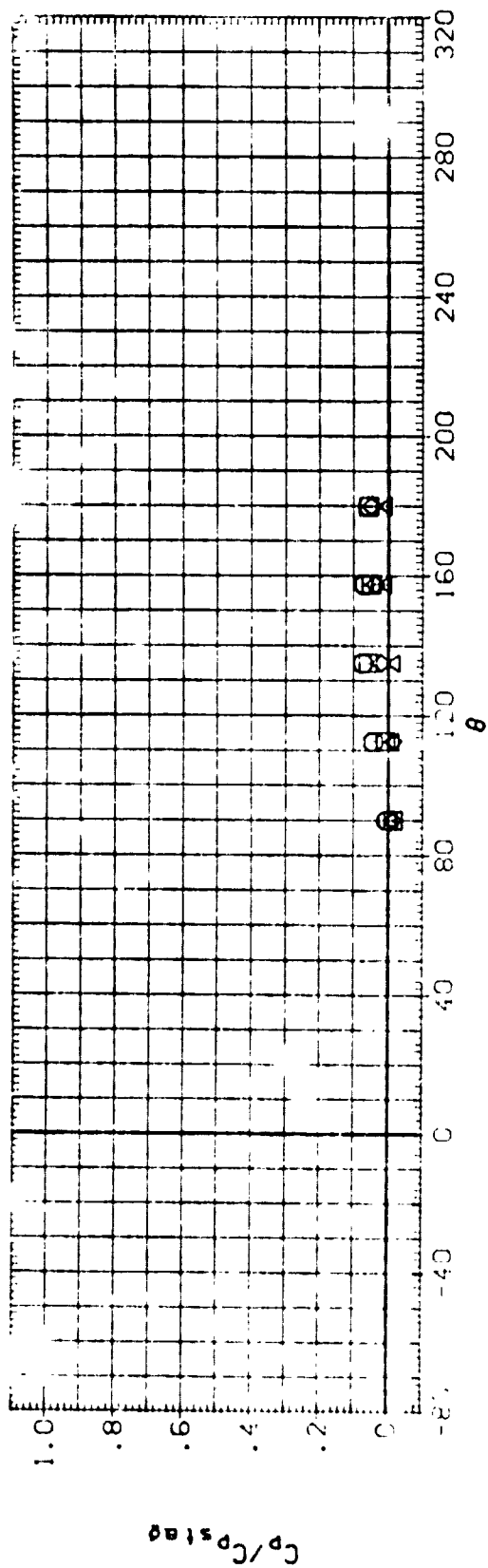


FIG. 38 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
BETA = 0. RN/L = 3.0

(R03TBB) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA X/LT PACH
 -10.000 .700 4.600
 -5.000 .850
 .000
 5.000

RN/L

3.000

BETA

.000

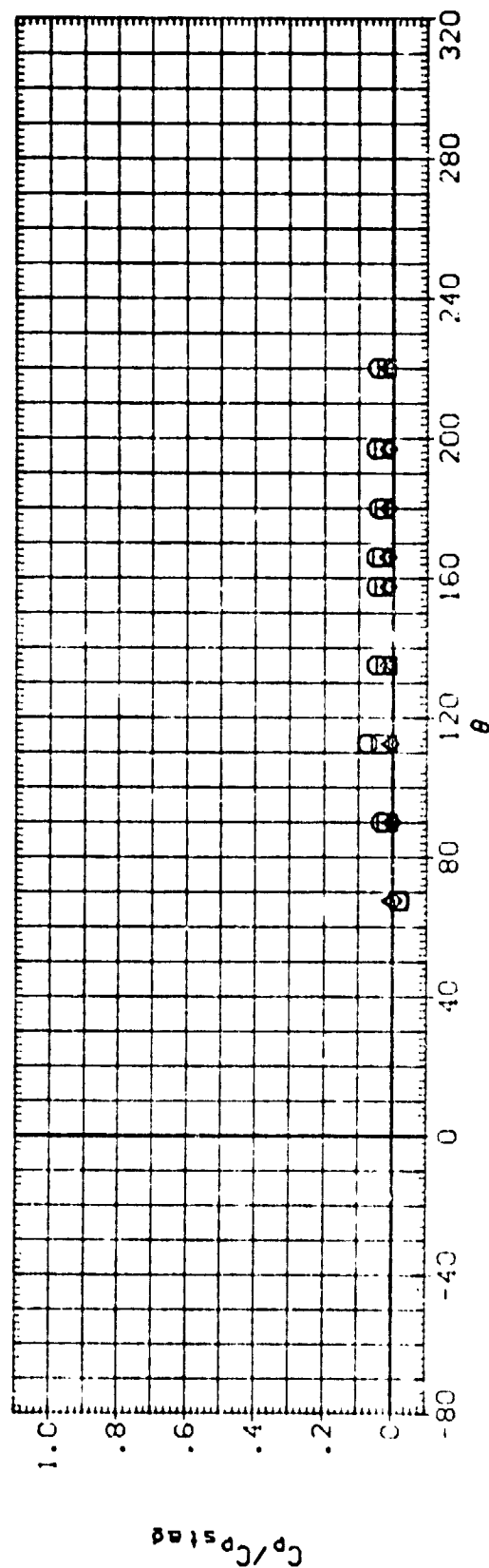
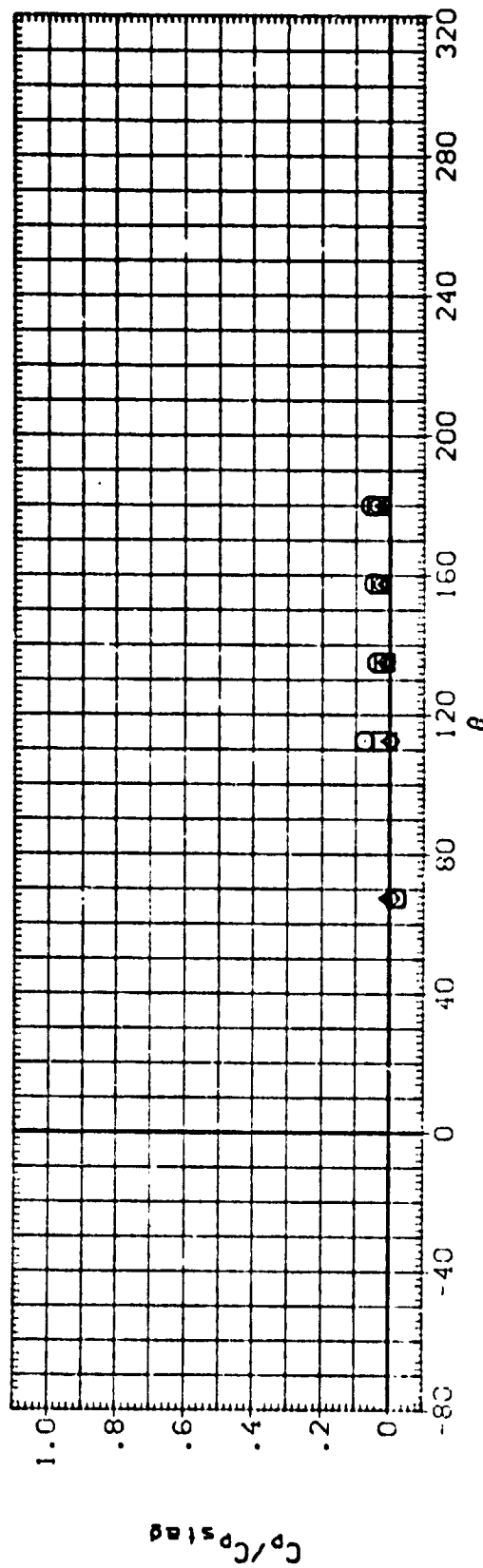


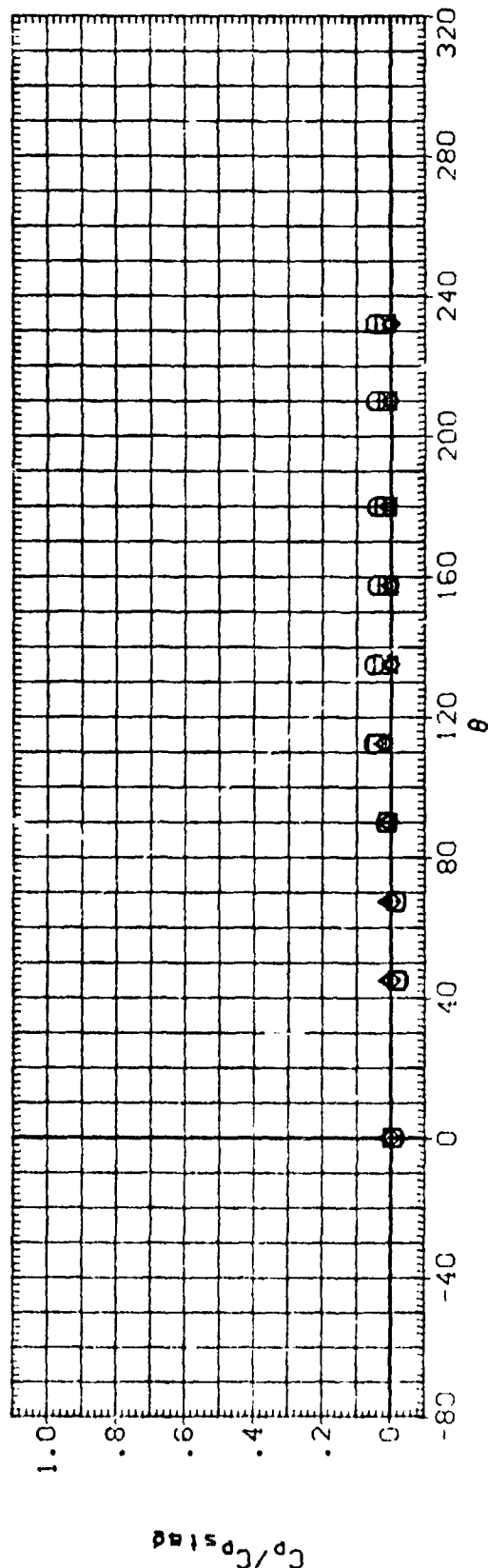
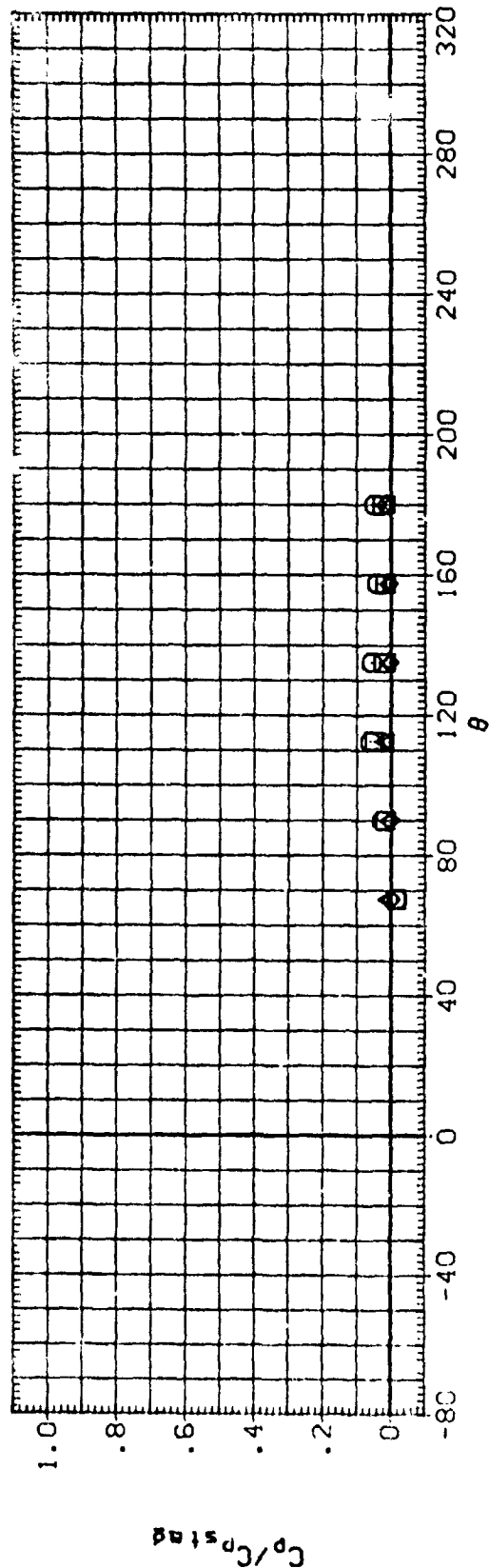
FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
 BETA= 0. RN/L= 3.0

(R03TBB) UPWT 1059 (IH4) 01-T22-S8N16 EXTERNAL TANK

SYMBOL ALPHA
 -10.000
 -5.000
 .000
 5.000

X/LT MACH
 .800 4.600
 .750

PARAMETRIC VALUES
 RN/L BETA
 3.000 .000



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FIG. 38 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
 BETA= 0. RN/L= 3.0

(RQ3TBB) UPWT 1059 (IH4) C1-T22-S8N16 EXTERNAL TANK

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH 4.600

X/LT .900
.850

ALPHA
-10.000
-5.000
.000
5.000

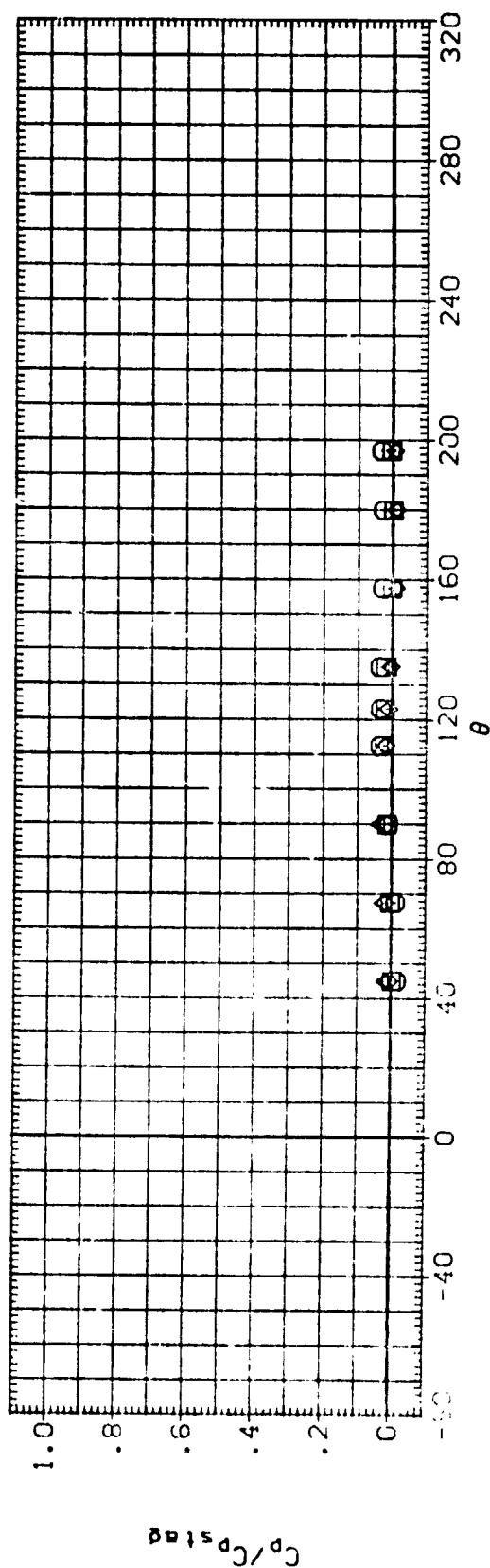
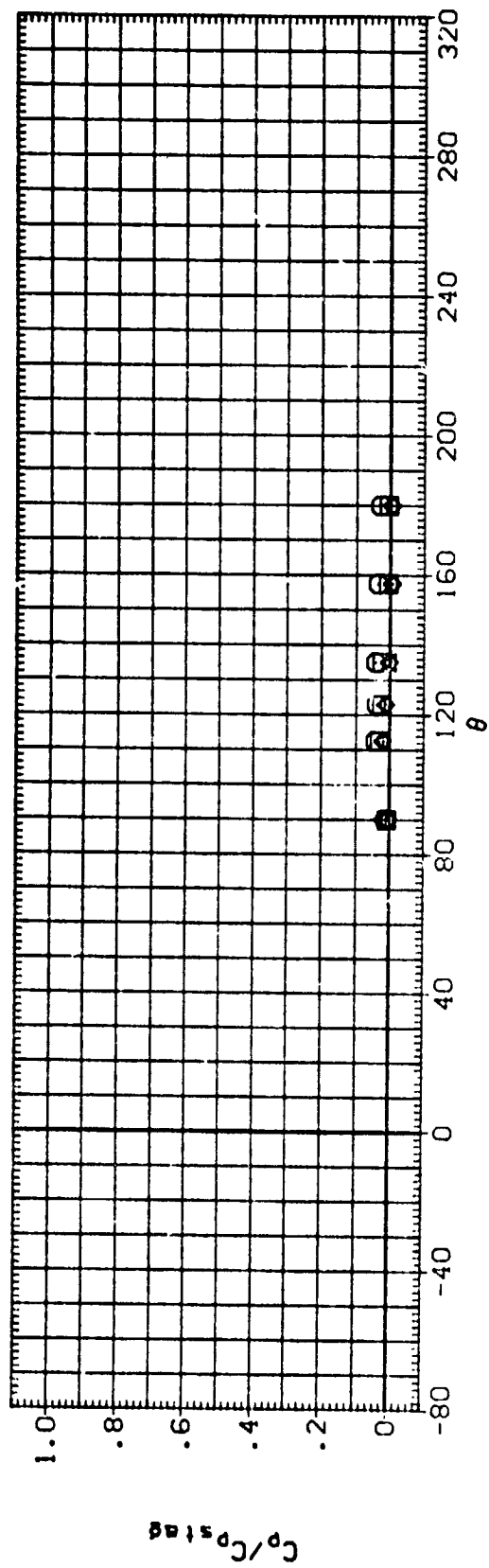


FIG. 38 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. EXTERNAL TANK.
BETA = 0. RN/L = 3.0

(R03SBB) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -10.000 180.000 3.700
 -5.000 90.000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

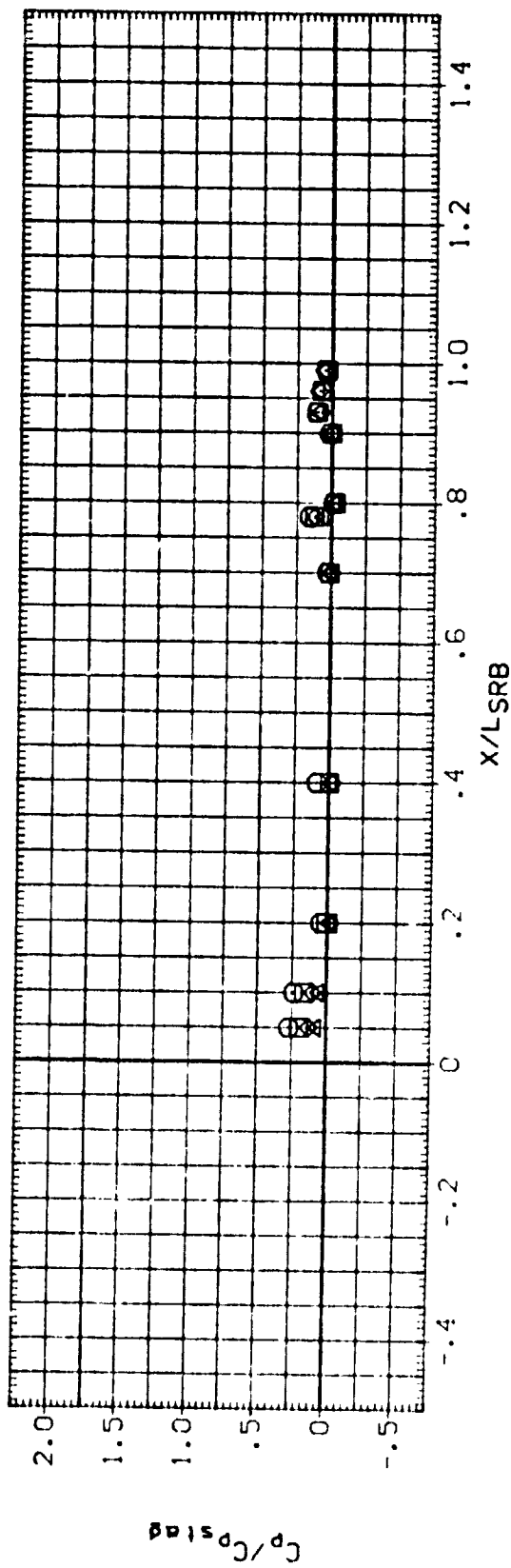
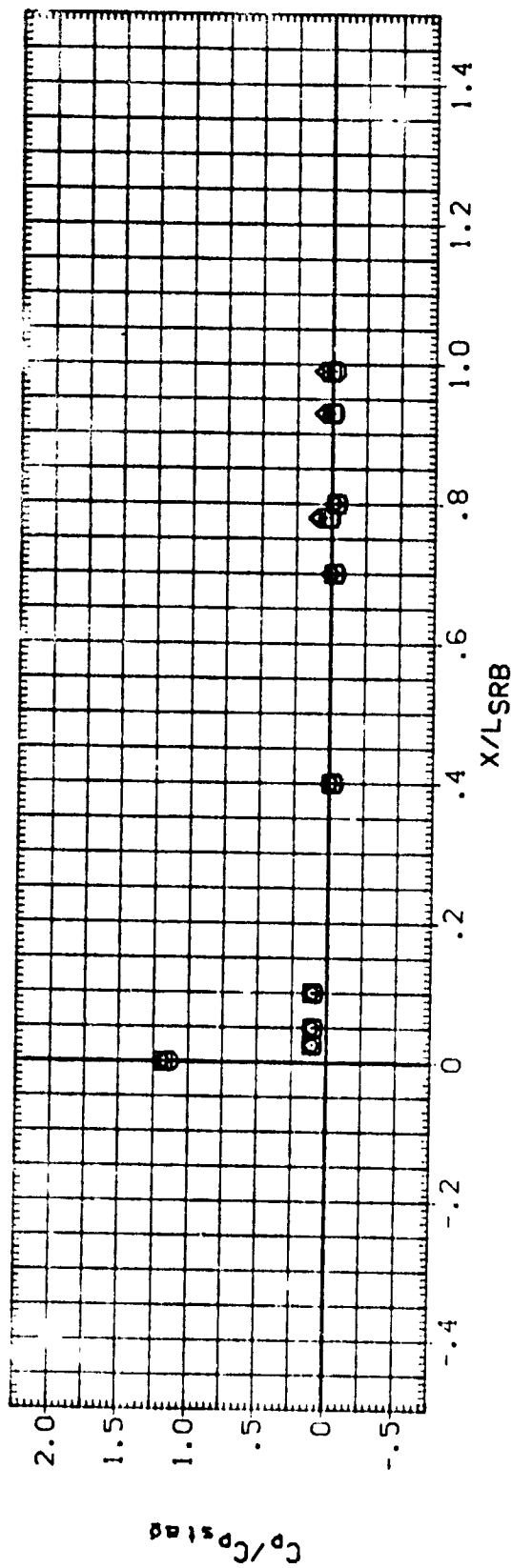



FIG. 39 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(RQ3S8B) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -10.000 225.000 3.700
 -5.000 210.000
 .000
 5.000

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

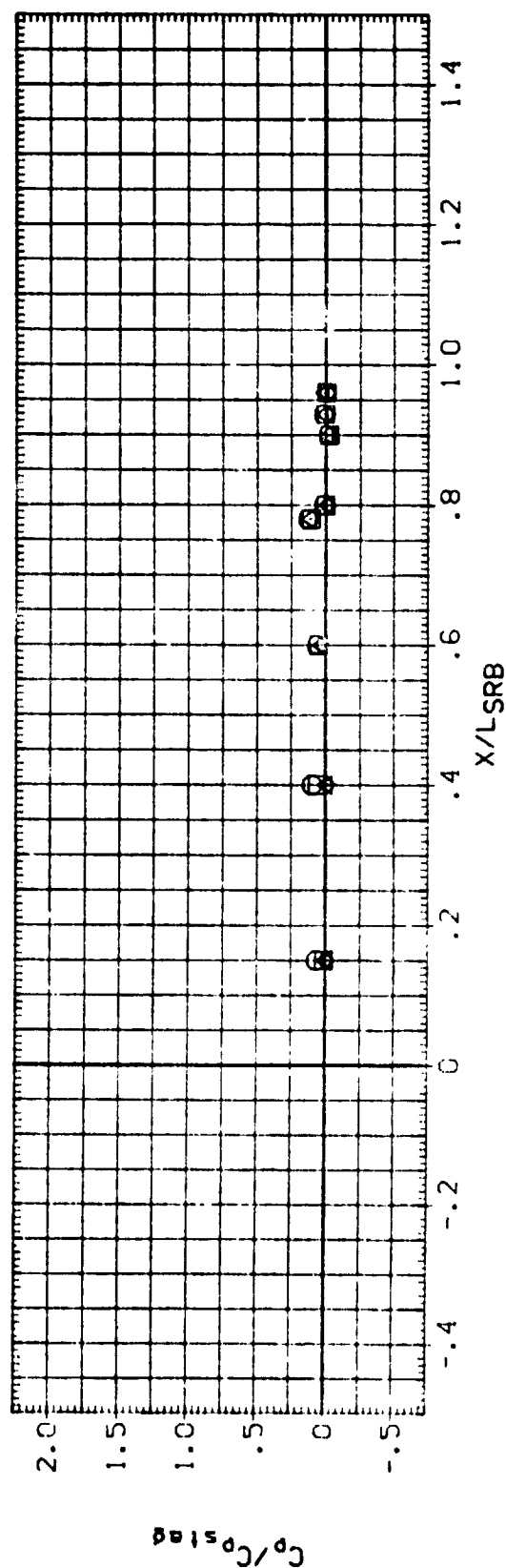
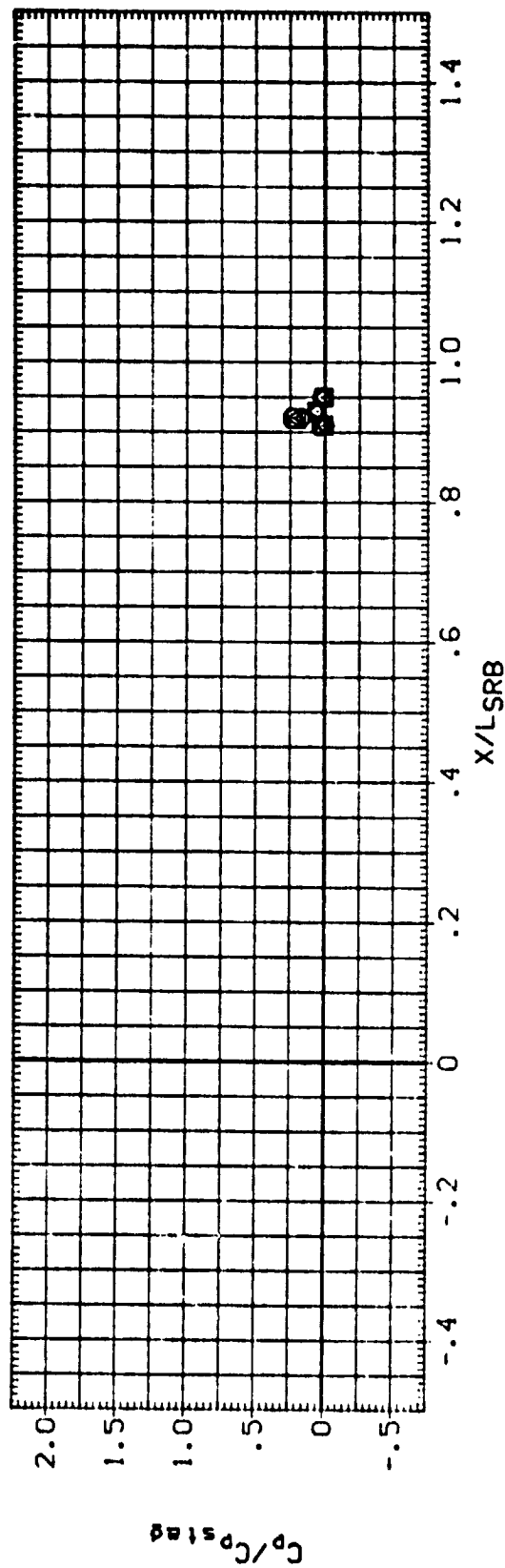


FIG. 39 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(RQ3SBB) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA PSI MACH
 -10.000 270.000 3.700
 -5.000 247.500
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA
 0.00

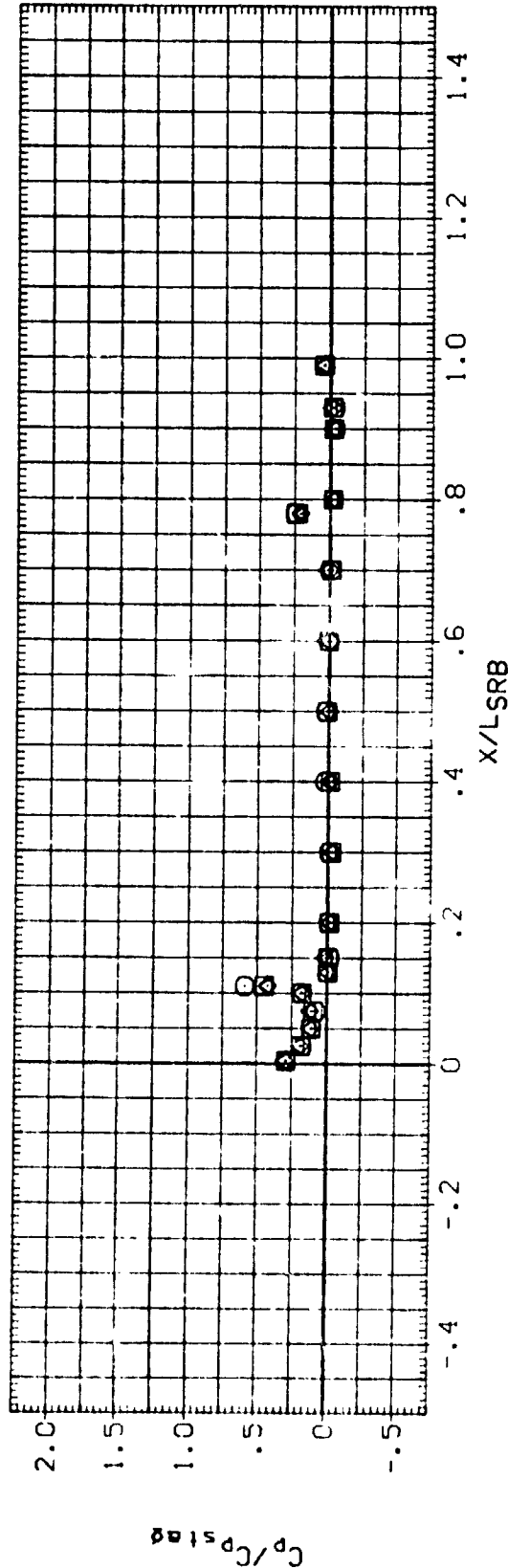
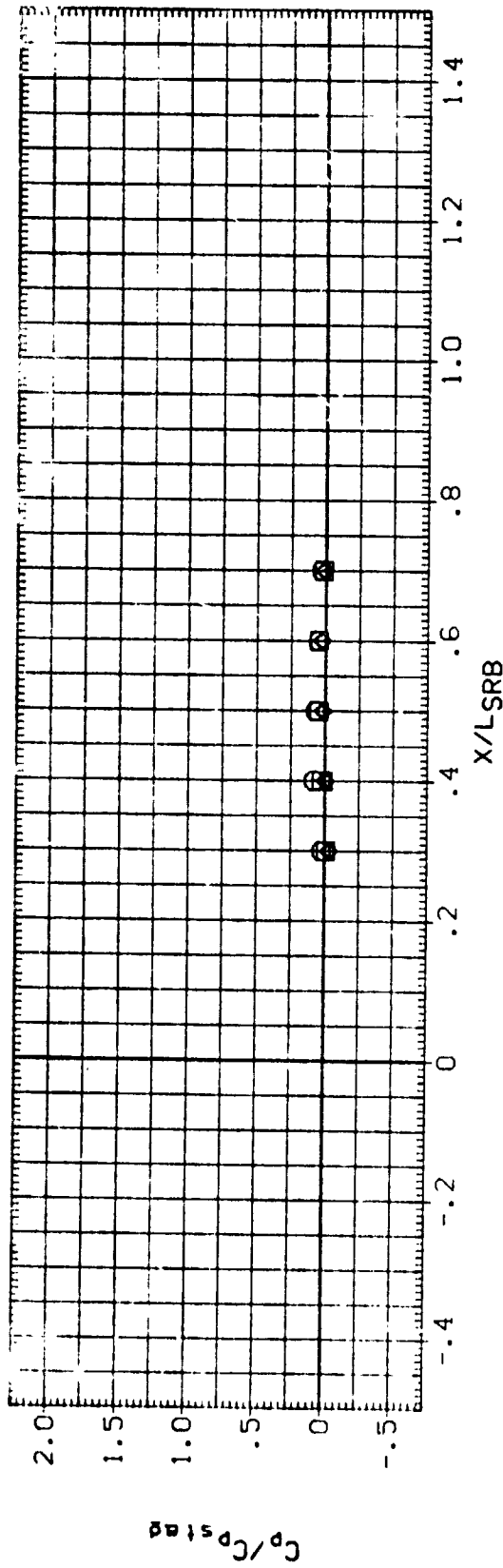


FIG. 39 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

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(RQ3SBB) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	PS:	MACH	PARAMETRIC VALUES
	-10.000	180.000	4.600	3.000 BETA .000
	-5.000	90.000		
	.000			
	5.000			

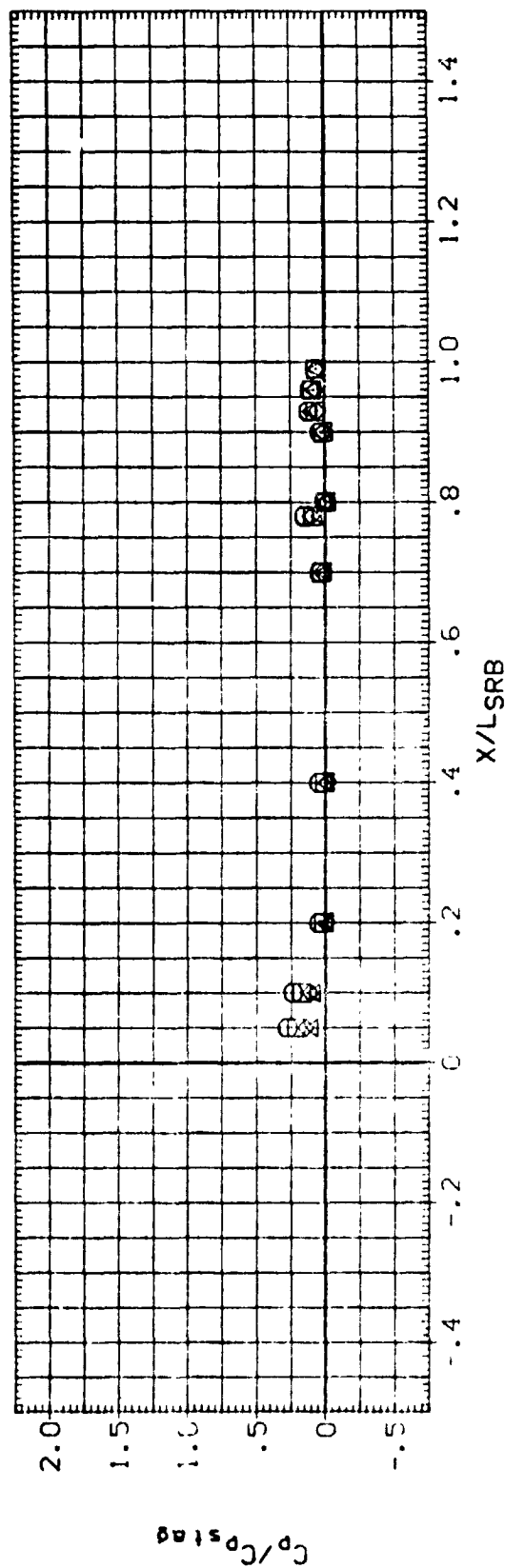
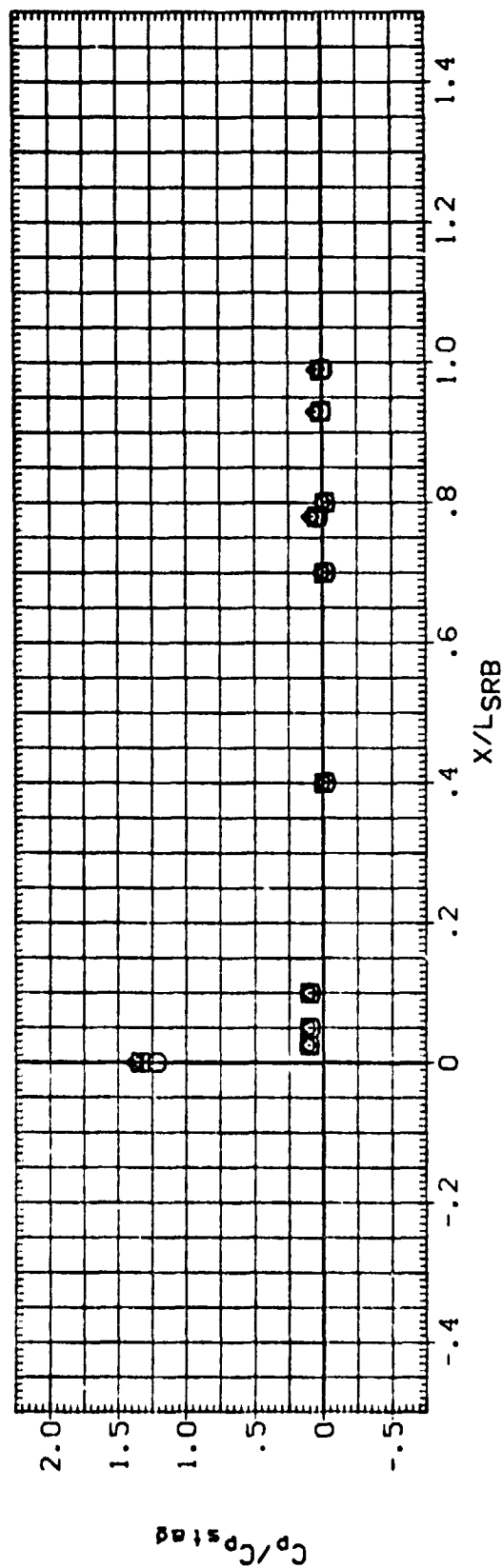


FIG. 39 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SBB) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL

ALPHA

PSI

MACH

-10.000

225.000

4.600

-5.000

210.000

5.000

PARAMETRIC VALUES

3.000

BETA

.000

RN/L

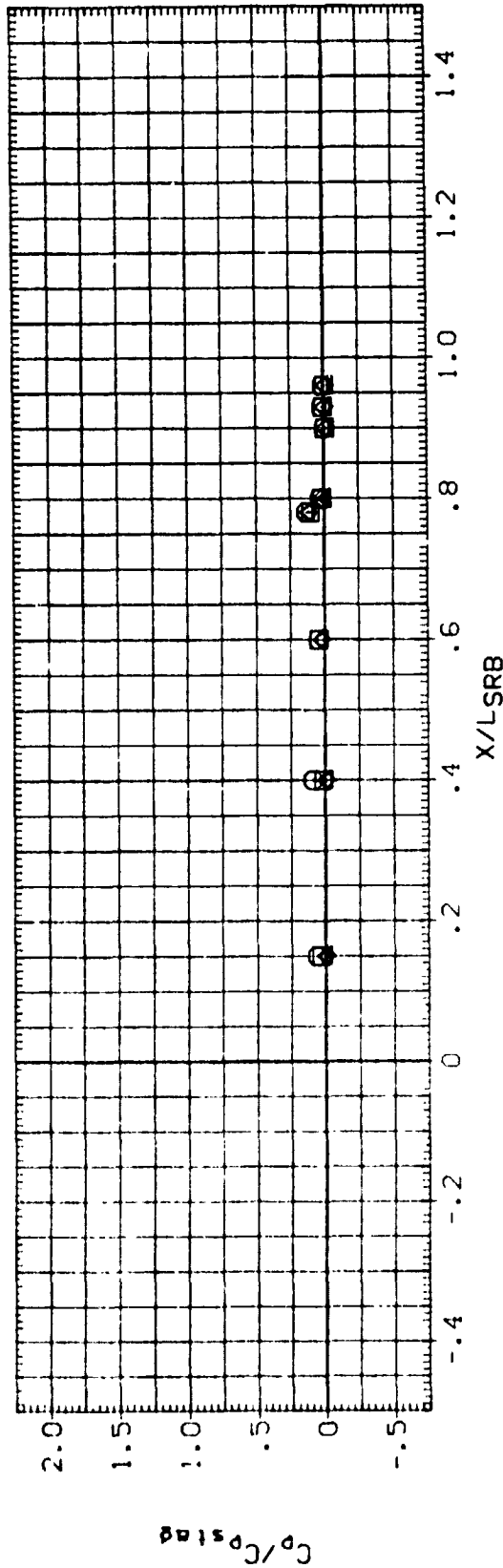
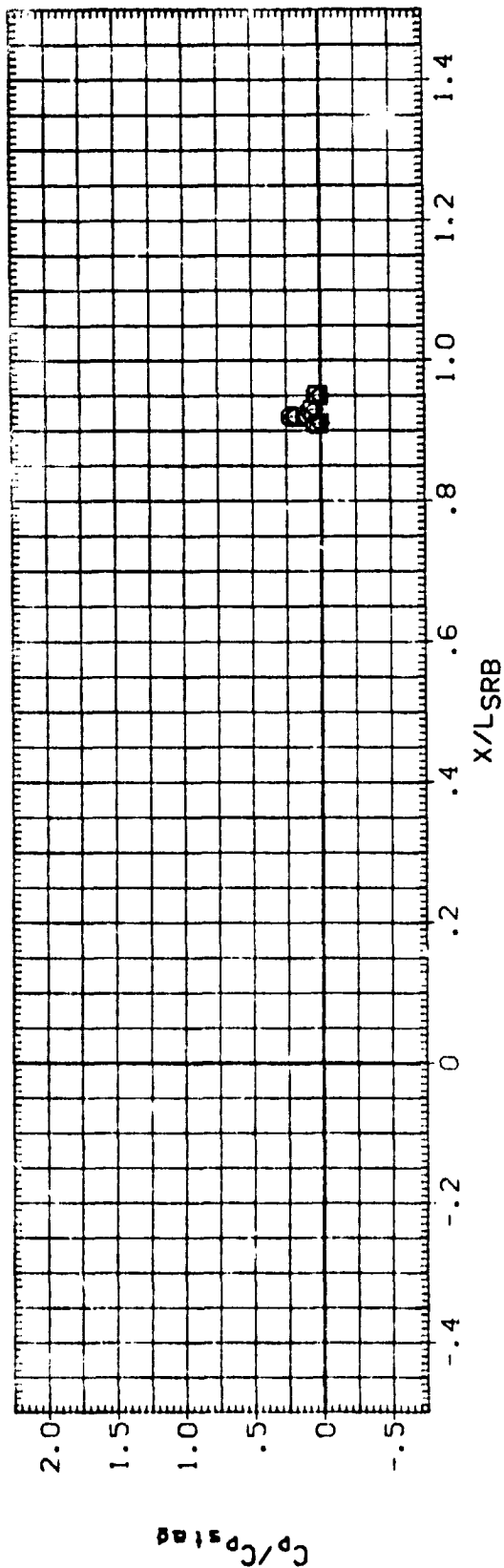


FIG. 39 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03S8B) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	PSI	MACH	RN/L	PARAMETRIC VALUES
□	-10.000	270.000	4.600	3.000	BETA
×	-5.000	247.500			.000
	.000				
	5.000				

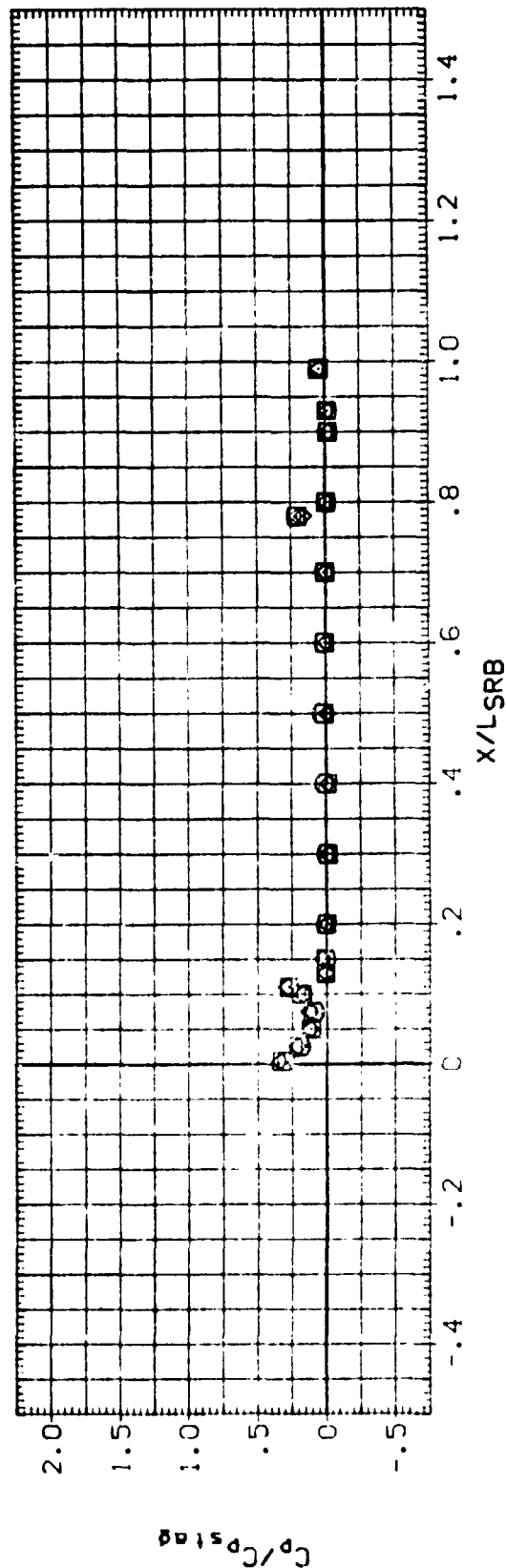
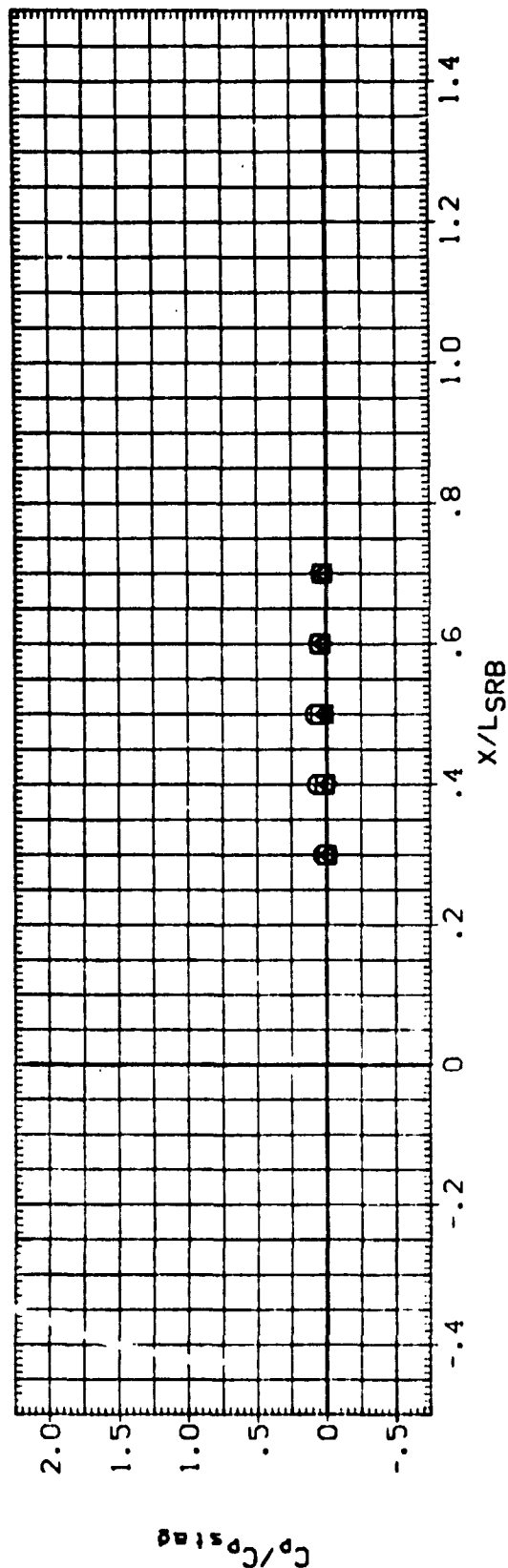


FIG. 39 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03SBB)

UPWT 1059 (IH4) 01-T22-S6N16 SOLID RCKT. BSTR.

SYMBOL

ALPHA

-10.000

.600

.400

MACH

3.700

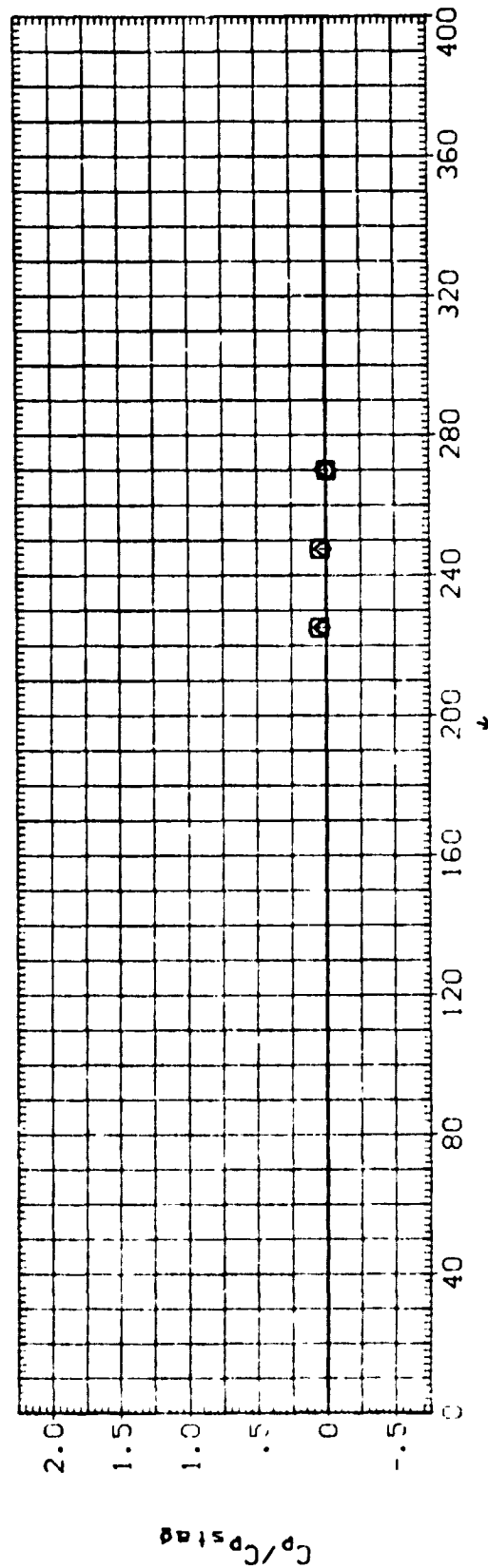
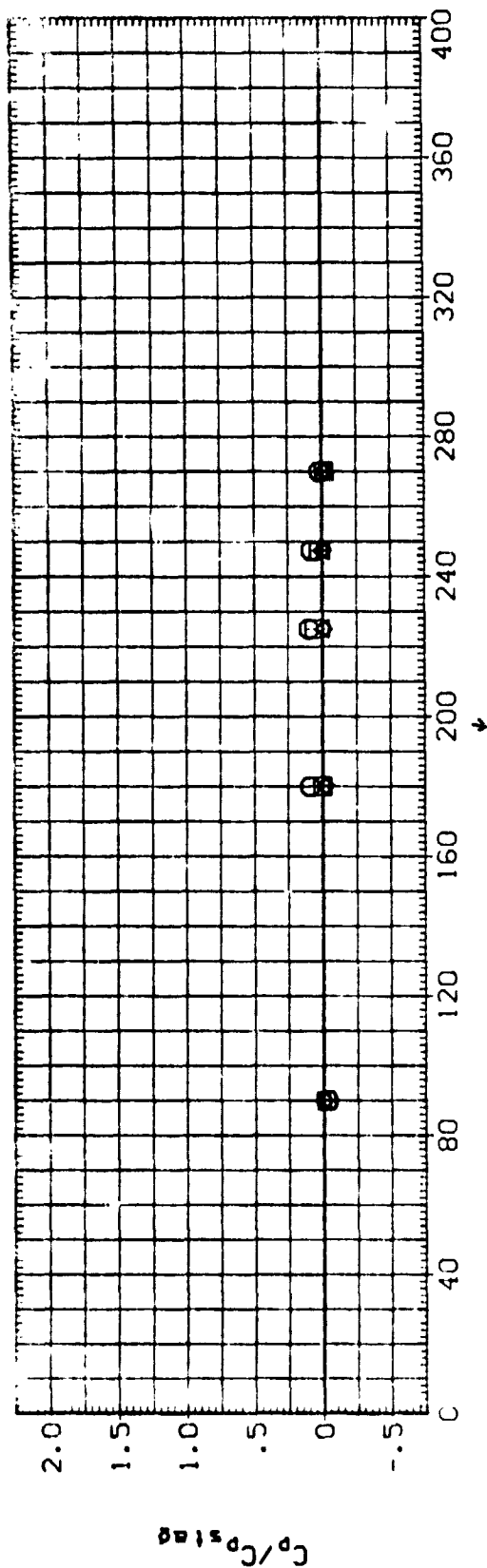
RN/L

PARAMETRIC VALUES

3.000

BETA

.00



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FIG. 39 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET
BOOSTER. BETA = 0. RN/L = 3.0

(R03SB8) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL	ALPHA	X/L S	MAC	RN/L	PARAMETRIC VALUES
	-10.000	.780	3.700		3.000
	-5.000	.700			BETA
	.000				.000
	5.000				

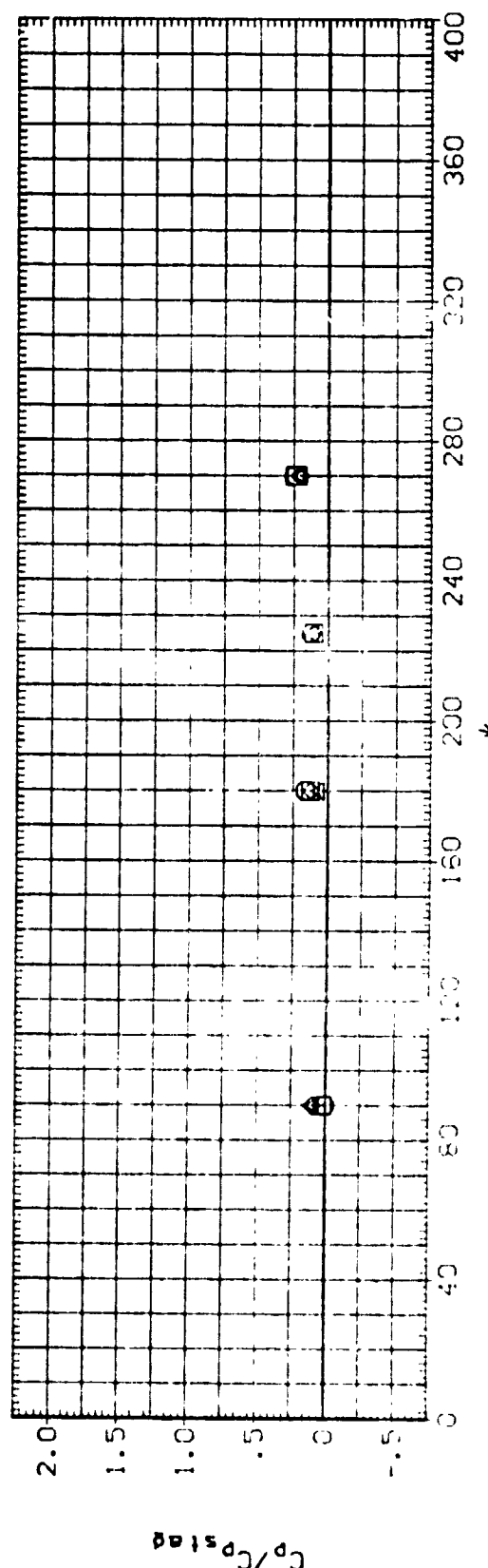
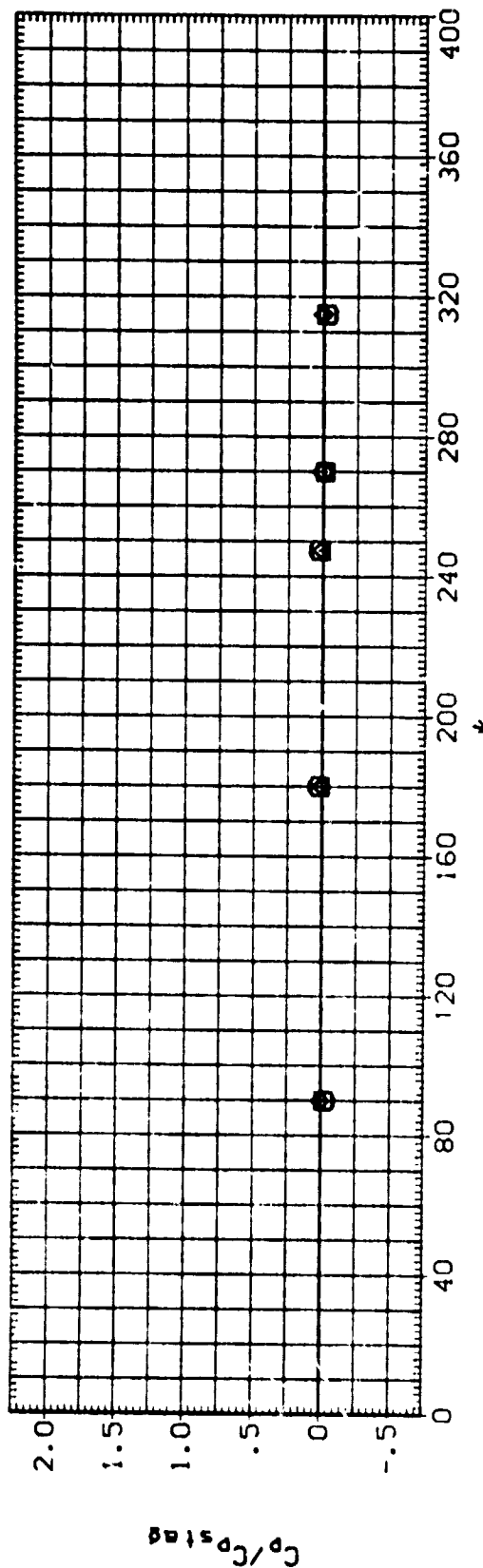


FIG. 39 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET BOOSTER. BETA = 0. RN/L = 3.0

(RQ3SBB) UPWT 1059 (IH4) G1-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSB8 MACH
 -10.000
 -5.000
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA
 0.50

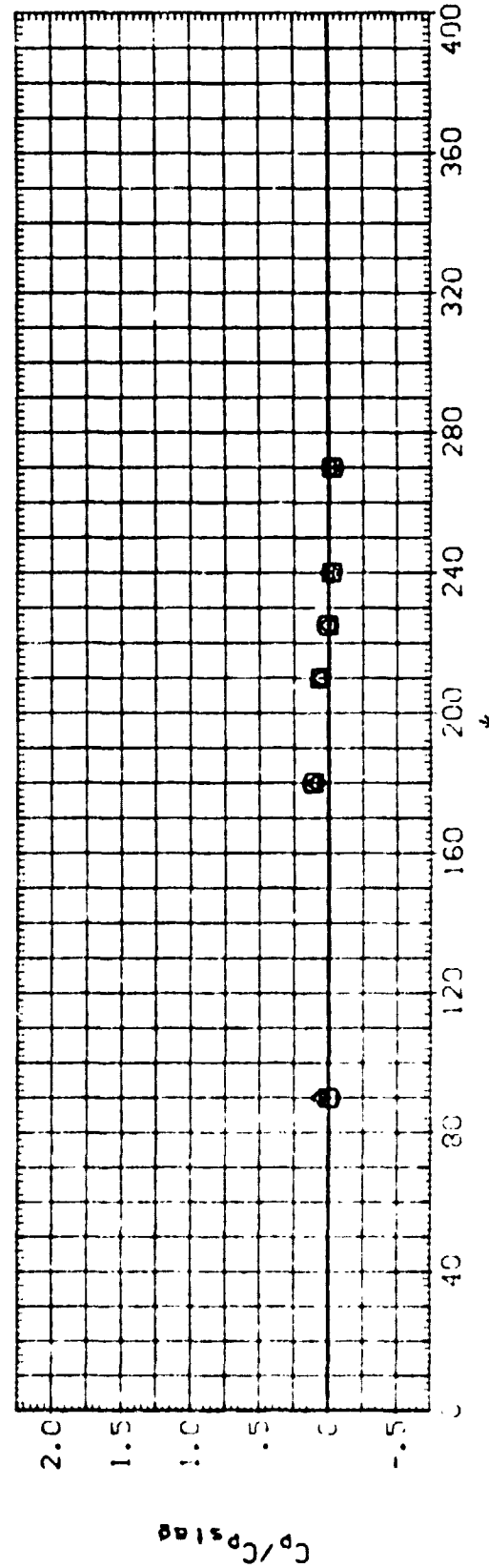
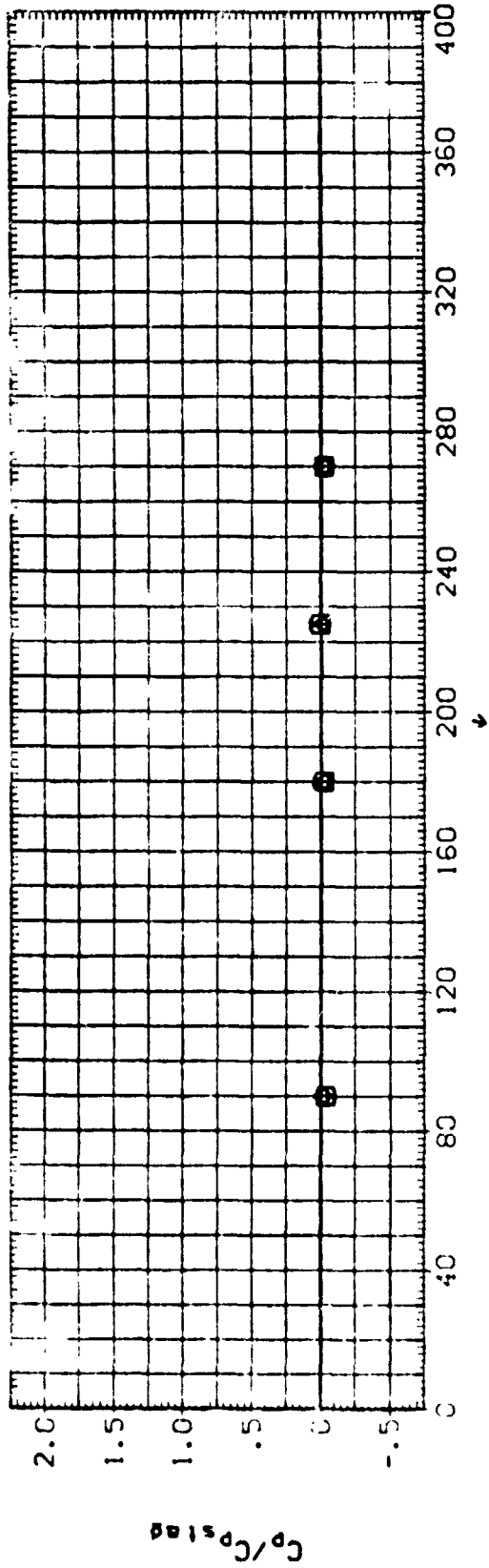


FIG. 39 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET BOOSTER. $BETA = 0$. $RN/L = 3.0$

(RQ3SBB) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL
 α
 β
 γ
 δ
 ϵ
 ζ
 η
 θ
 ι
 κ
 λ
 μ
 ν
 ξ
 \omicron
 π
 ρ
 σ
 τ
 υ
 ϕ
 χ
 ψ
 ω

ALPHA
 -1.0000
 -5.0000
 -0.0000
 0.0000
 5.0000

X/LSFS
 -990
 -990

MACF
 3.700

PARAMETRIC VALUES
 RN/L 3.000 BETA .000

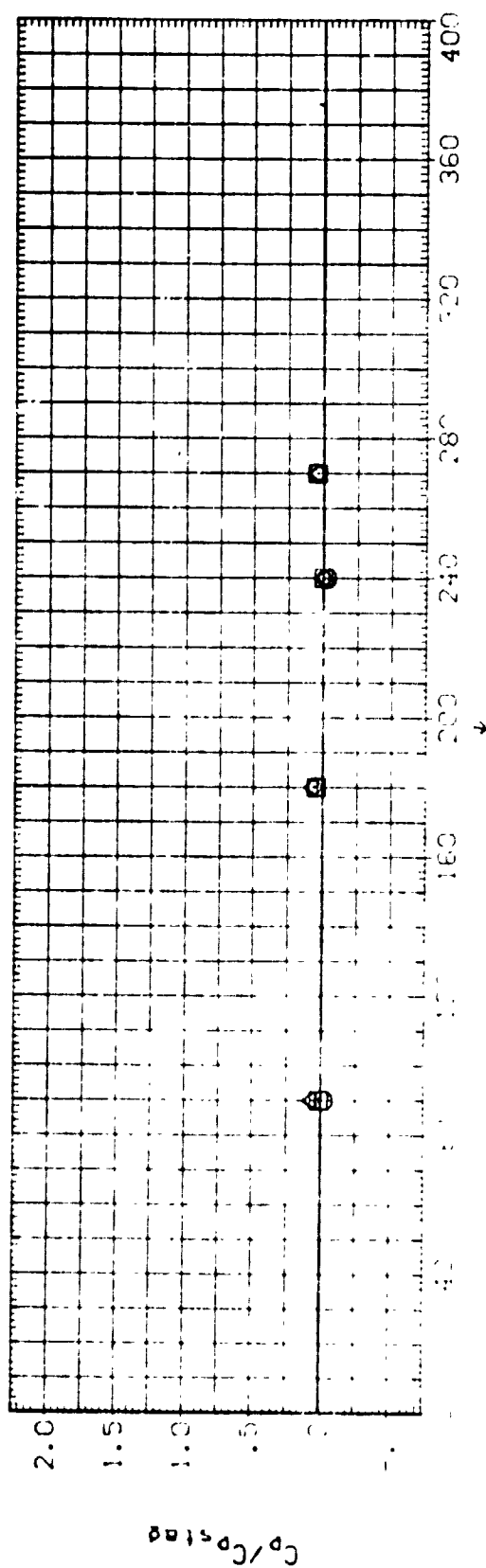
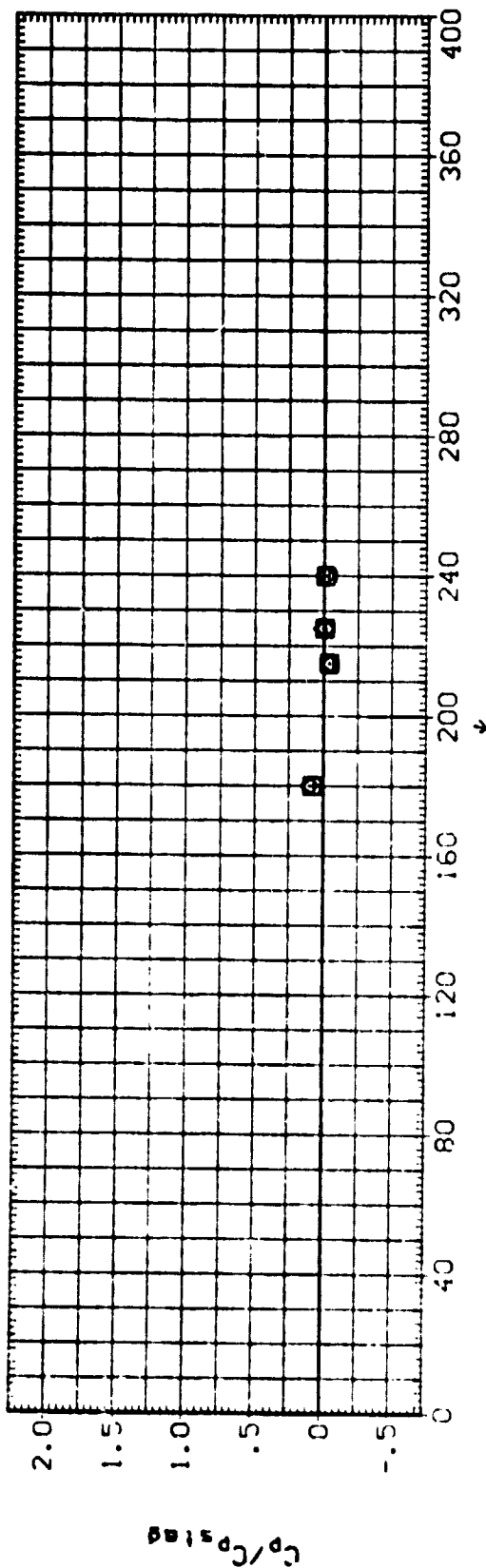
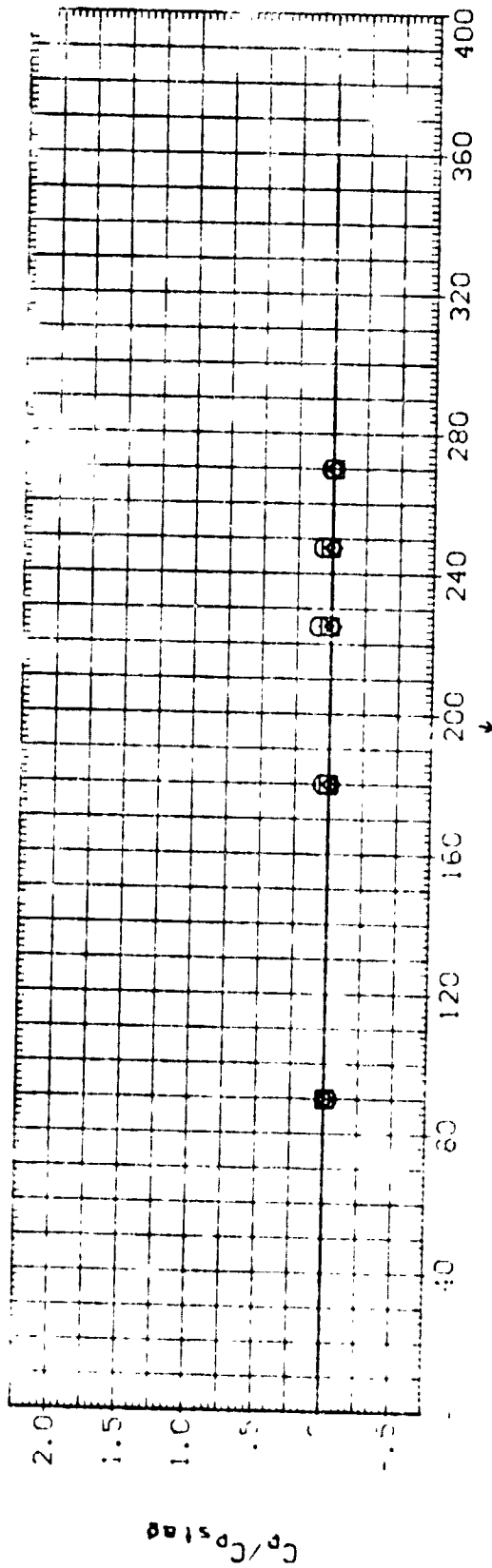


FIG. 30 VARIATION OF C_p/C_{pstd} ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET
 UPWT 1059 (IH4) 01-T22-S8N16. RN/L = 3.0

(R03585) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA X/LSPB MACH
 -10.000
 -5.000
 -1.000
 5.000

RV/L 3.000



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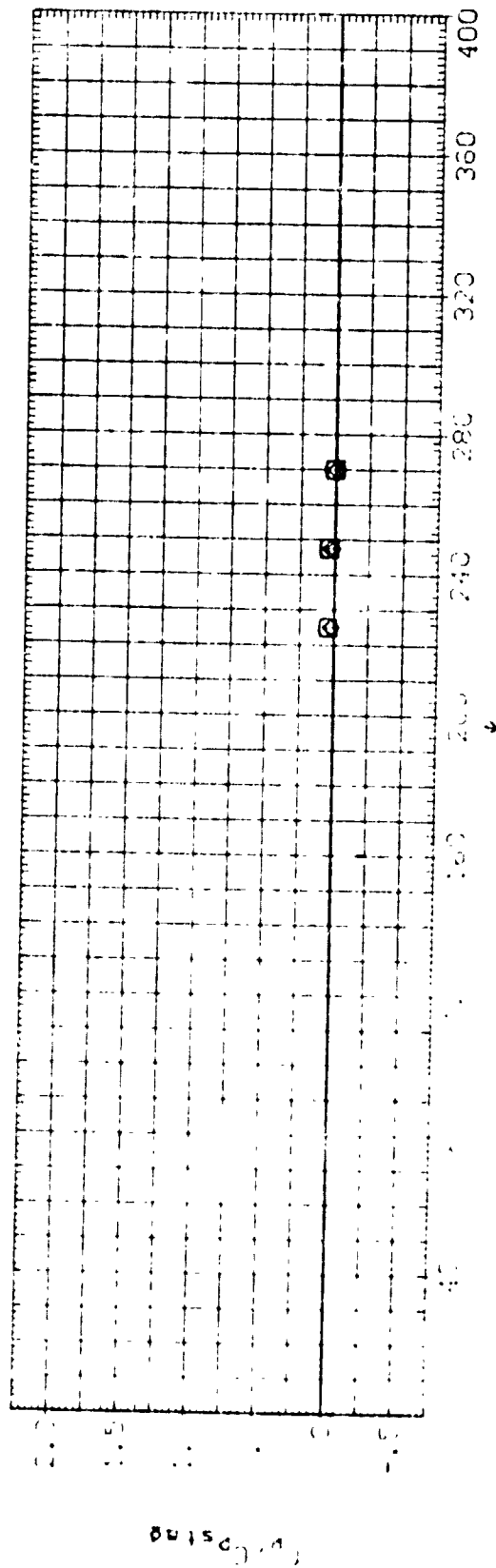


FIG. 39 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET
 BCCS-EP, BETA= 0, RN/L= 3.0

(RQ3SBB) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.
 SYMBO ALPHA X/SRB MACH 4.600
 -10.000 .780
 -5.000 .700
 .000
 5.000

PARAMETRIC VALUES
 3.000 BETA .000
 RN/L

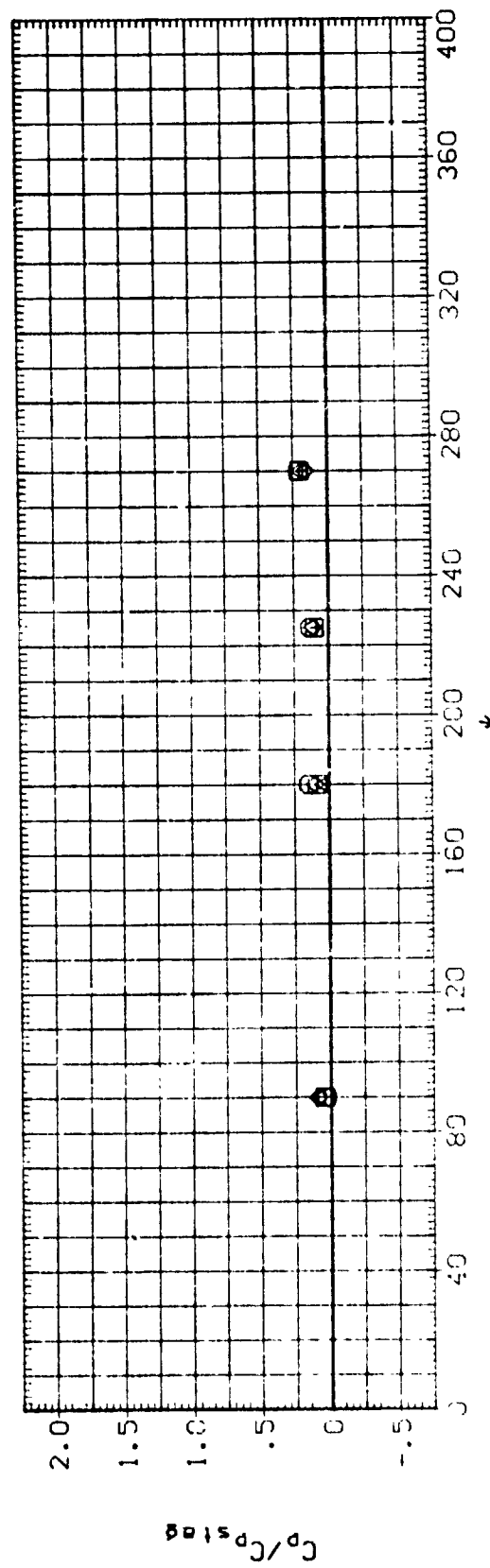
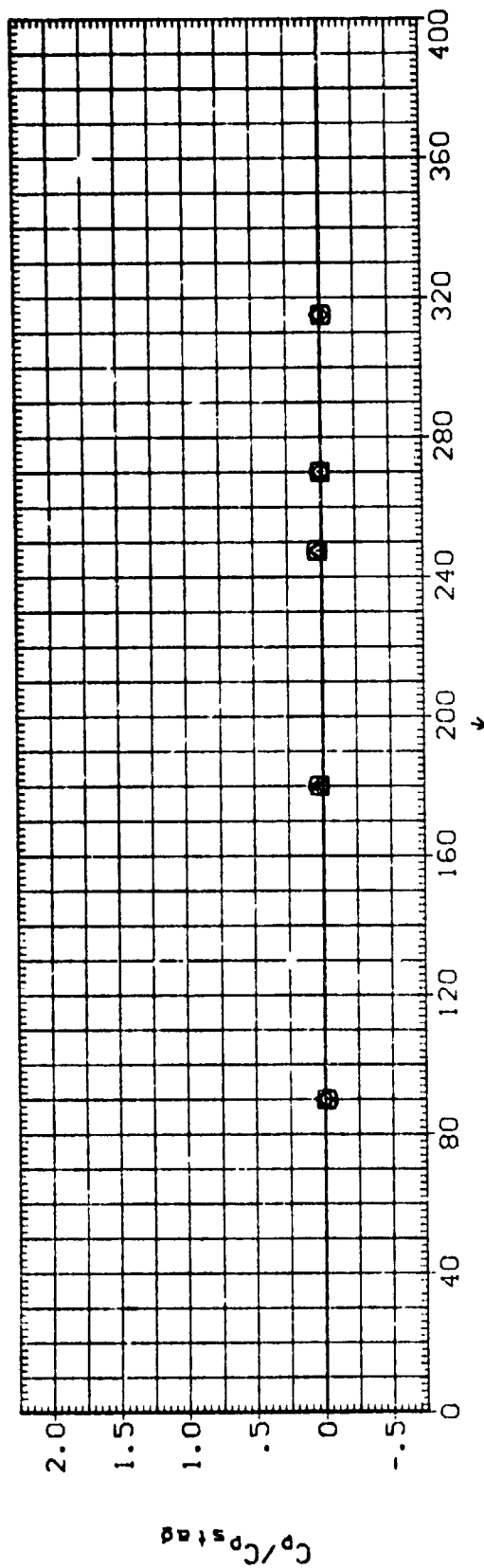


FIG. 39 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(R03S88) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

SYMBOL ALPHA
-10.000
-5.000
0.000
5.000

X/LSRS
.930
.800

MACH
4.600

RN/L

PARAMETRIC VALUES
3.000 BETA .00

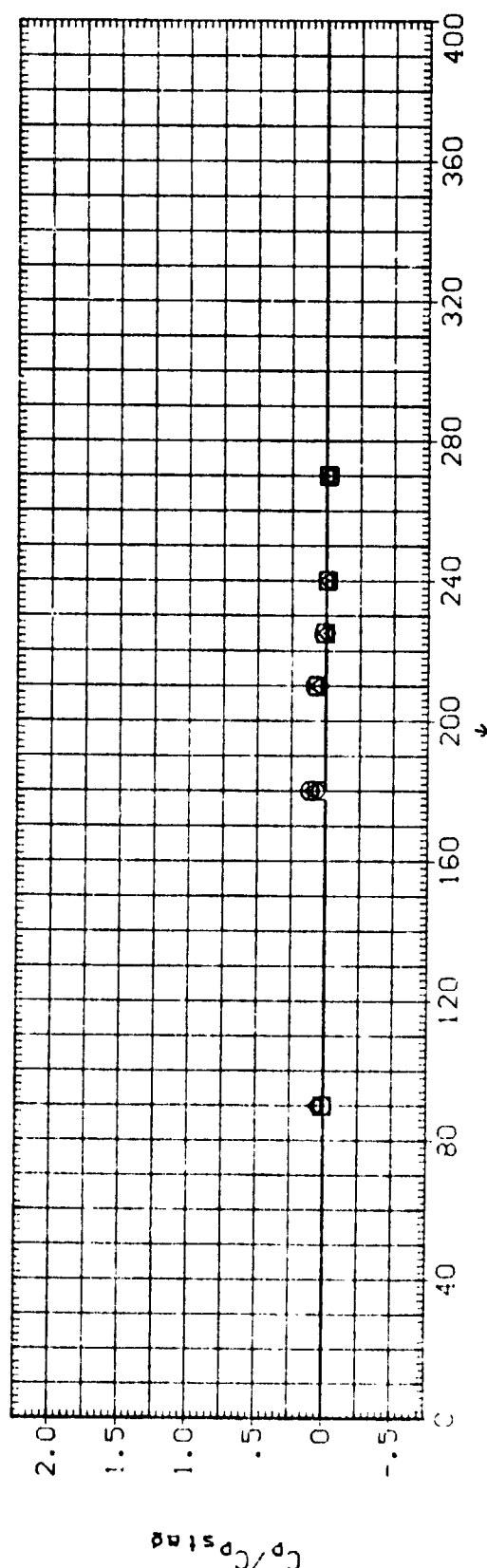
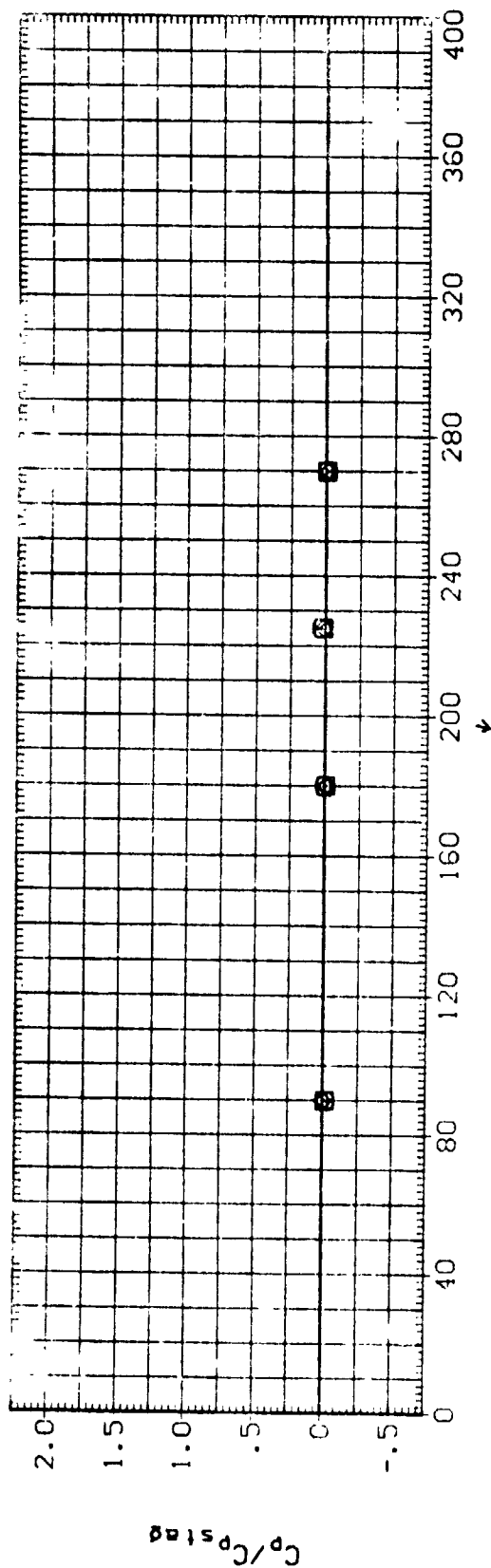


FIG. 39 VARIATION OF CP/CPS ON THE INTEGRATED VEHICLE WITH T22, SOLID ROCKET BOOSTER. BETA= 0. RN/L= 3.0

(RQ3SBB) UPWT 1059 (IH4) 01-T22-S8N16 SOLID RCKT. BSTR.

PARAMETRIC VALUES
3.000 BETA .000

RN/L

MACH 4.600

X/LSPS .990 .960

ALPHA -10.000 -5.000 .000 5.000

SYMBOL \square \boxtimes

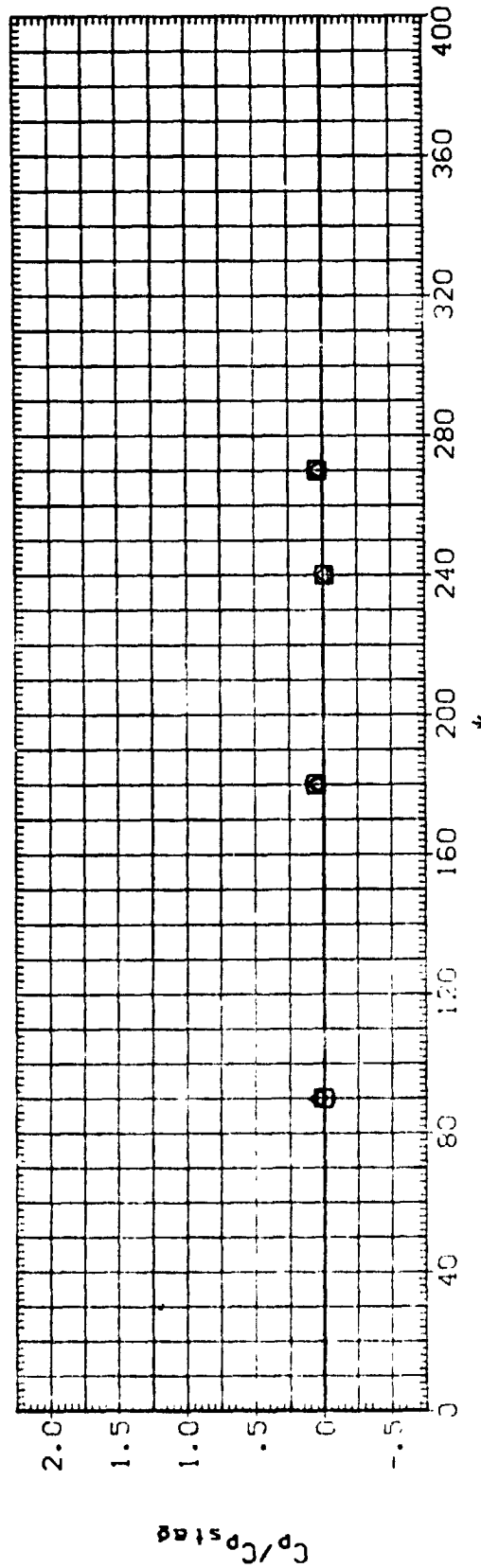
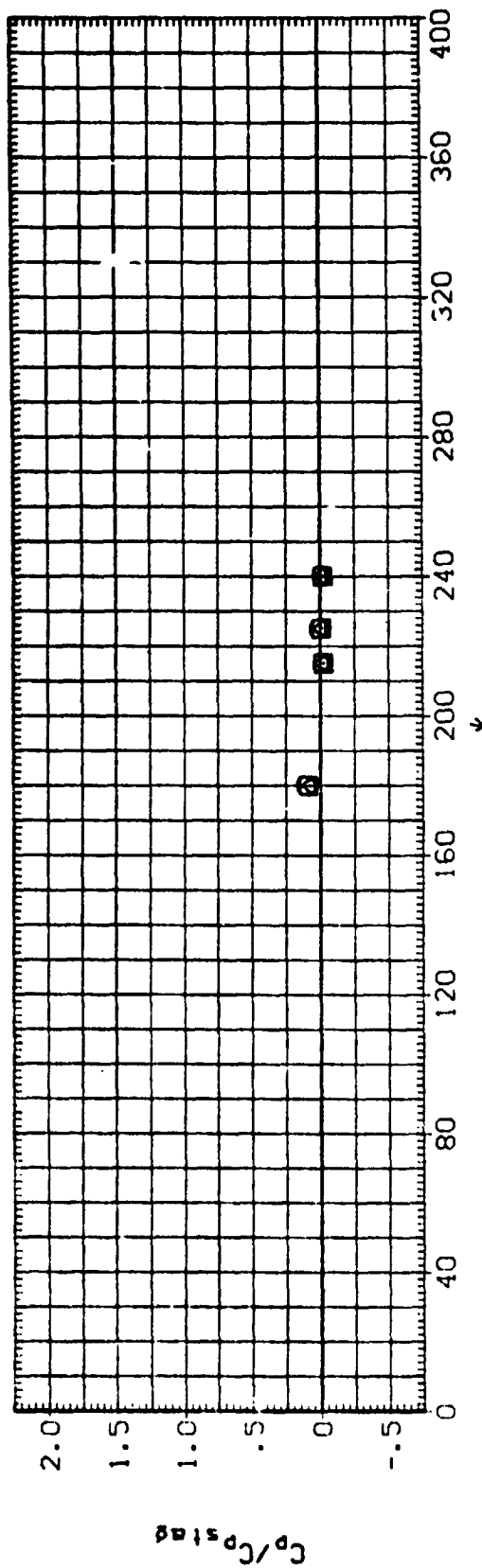


FIG. 39 VARIATION OF C_p/C_{ps} ON THE INTEGRATED VEHICLE WITH T22. SOLID ROCKET BOOSTER, BETA= 0, RN/L= 3.0

(R338CD) UPWT 1059 (IH4) 01 ALONE
 SYMBOL ALPHA PHI MACH
 -5.000 95.000 3.700
 .000

ORBITER FUSELAGE

PARAMETRIC VALUES
 RN/L 3.000 BETA -4.000

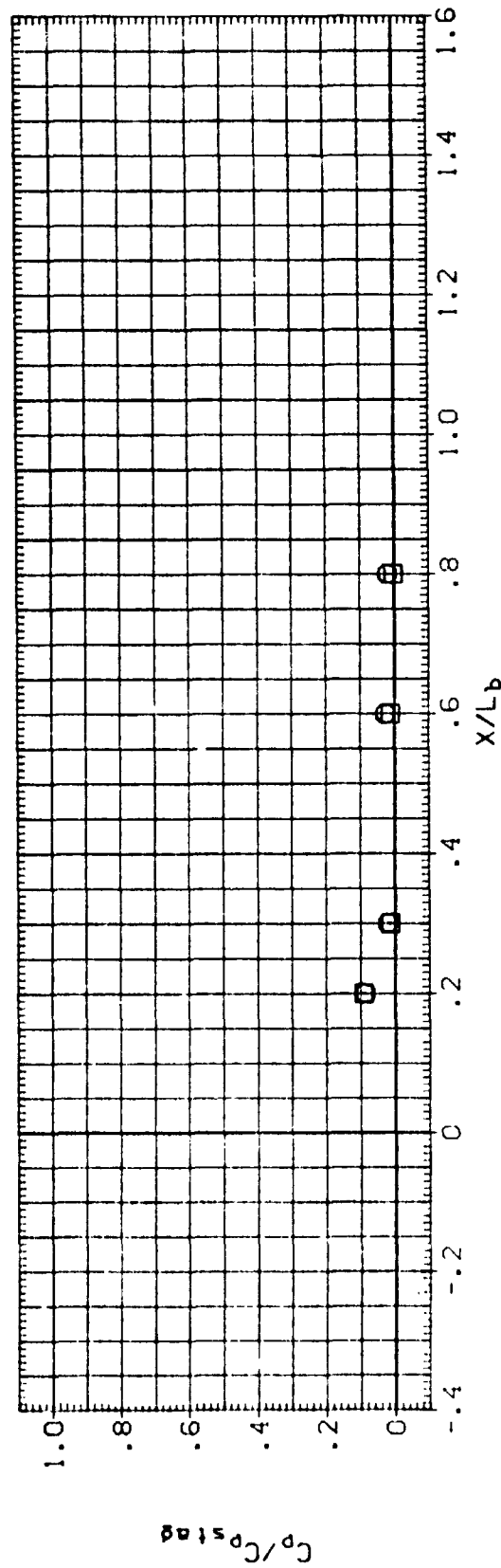
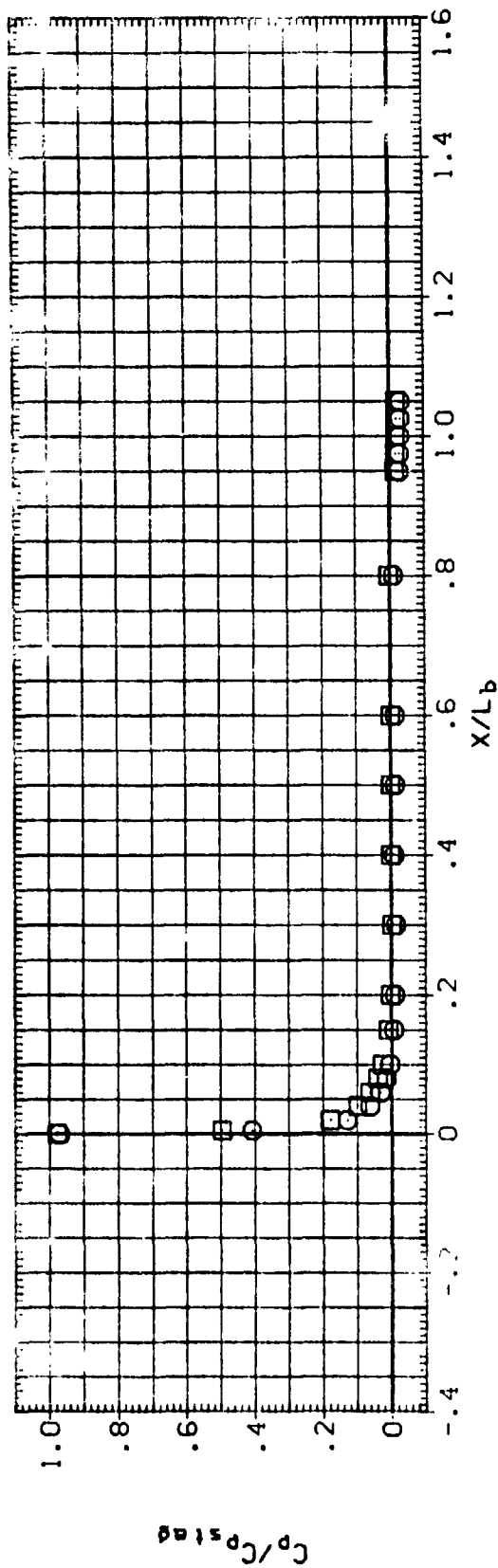


FIG. 40 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. FUSELAGE.
 BETA=-5, RN/L= 3.0

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(R03BCD) PW 1059 (IH4) 01 ALONE ORBITER FUSELAGE
 SYMBOL ALPHA PHI MACH 3.700
 -5.000 180.000
 .000 122.700
 PARAMETRIC VALUES 3.000 BETA -5.000

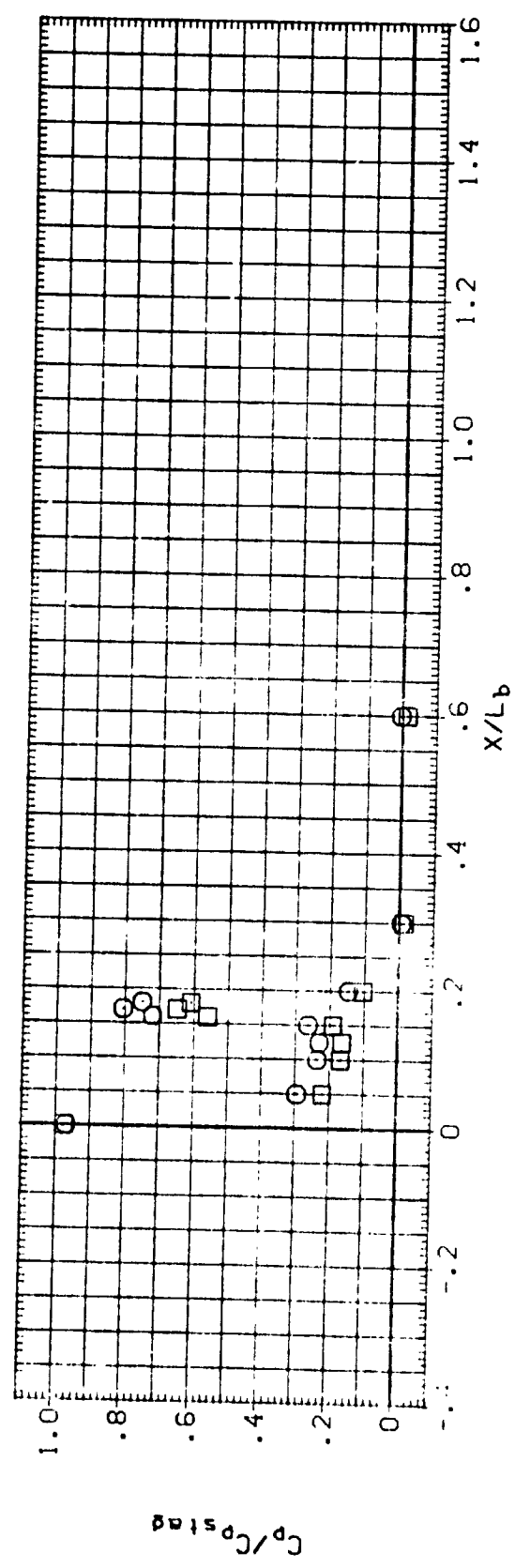
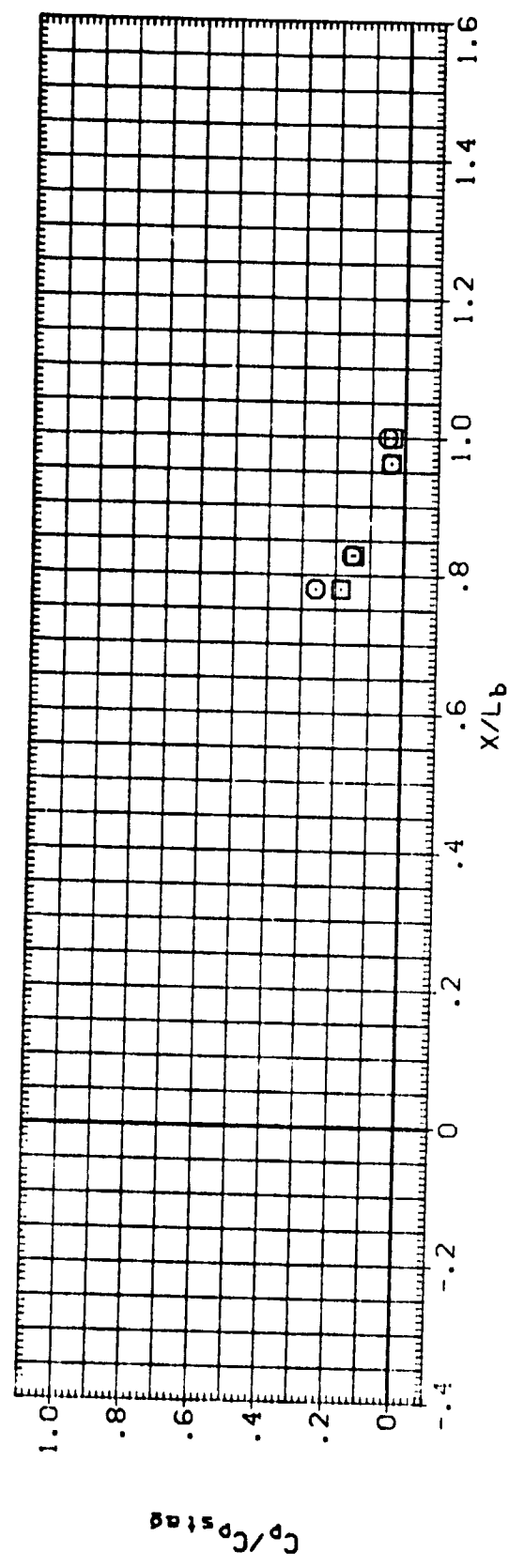


FIG. 40 VARIATION OF CP/CPS ON THE ISOLATED ORBITER, FUSELAGE. BETA=-5, RN/L= 3.0

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(R038C0)
SYMBOL ALPHA
-5.000 95.000
.000

MACH
4.000

RN/L VAL -S
3.000 50.0 -5.000

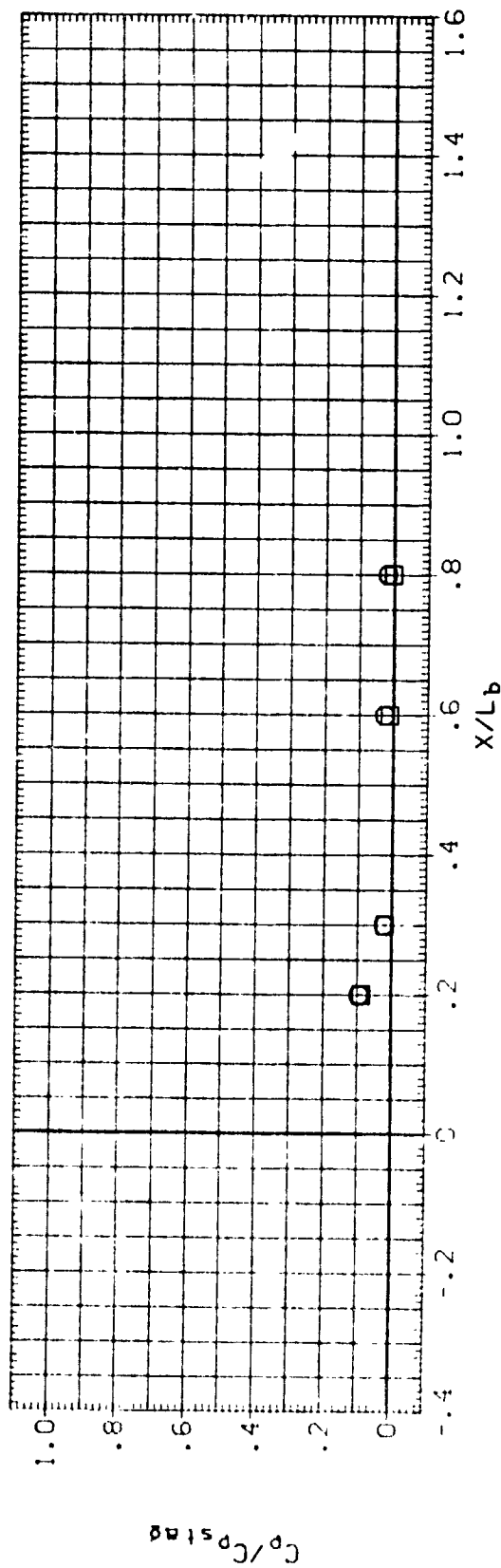
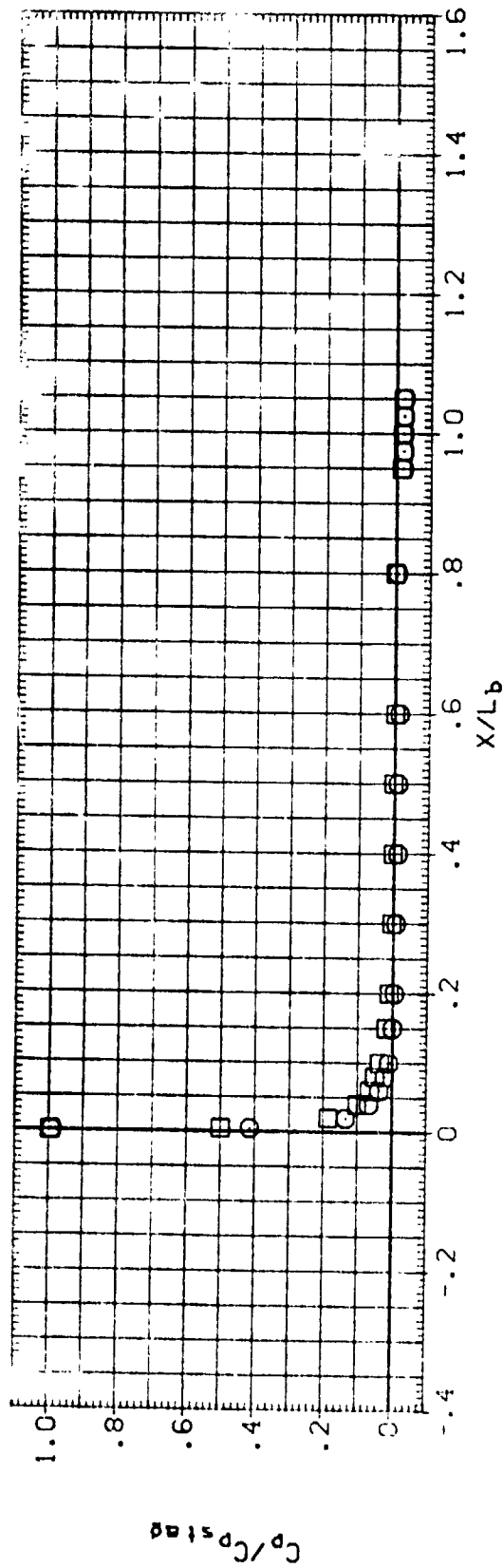


FIG. 40 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. FUSELAGE.
BETA=-5. RN/L= 3.0

(RQ3BC0) UPWT 1059 (IH4) 01 ALONE ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MAC	RN/L	PARAMETRIC VALUES
□	-5.000	180.00	4.00		3.000 BETA
○	.000	122.70			-5.000

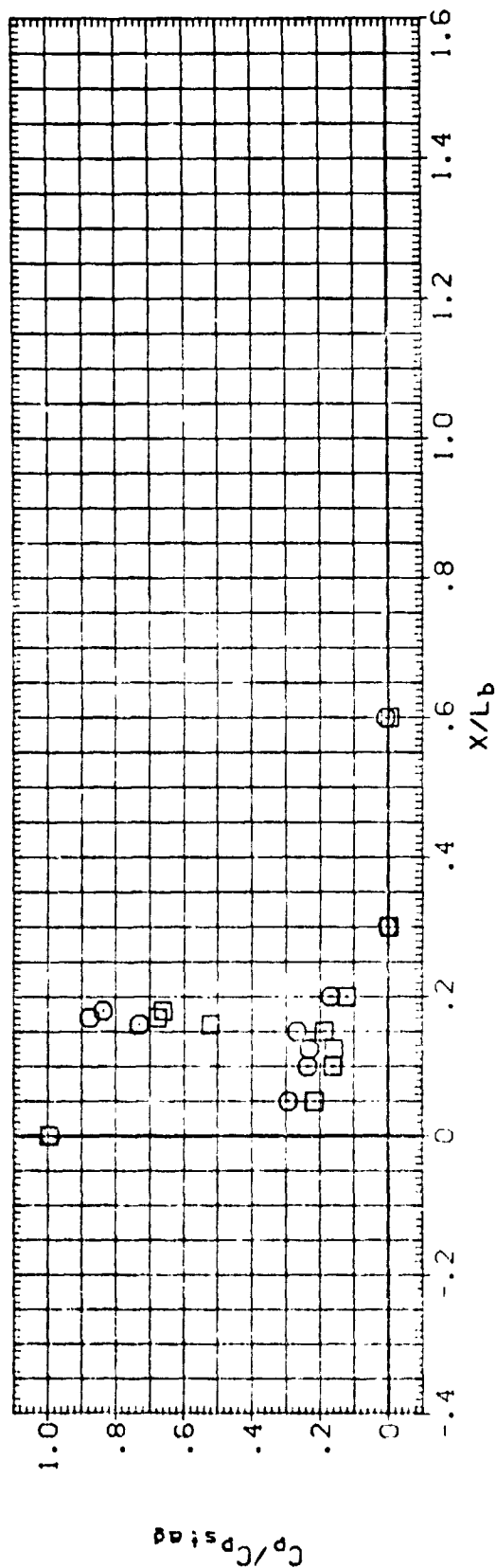
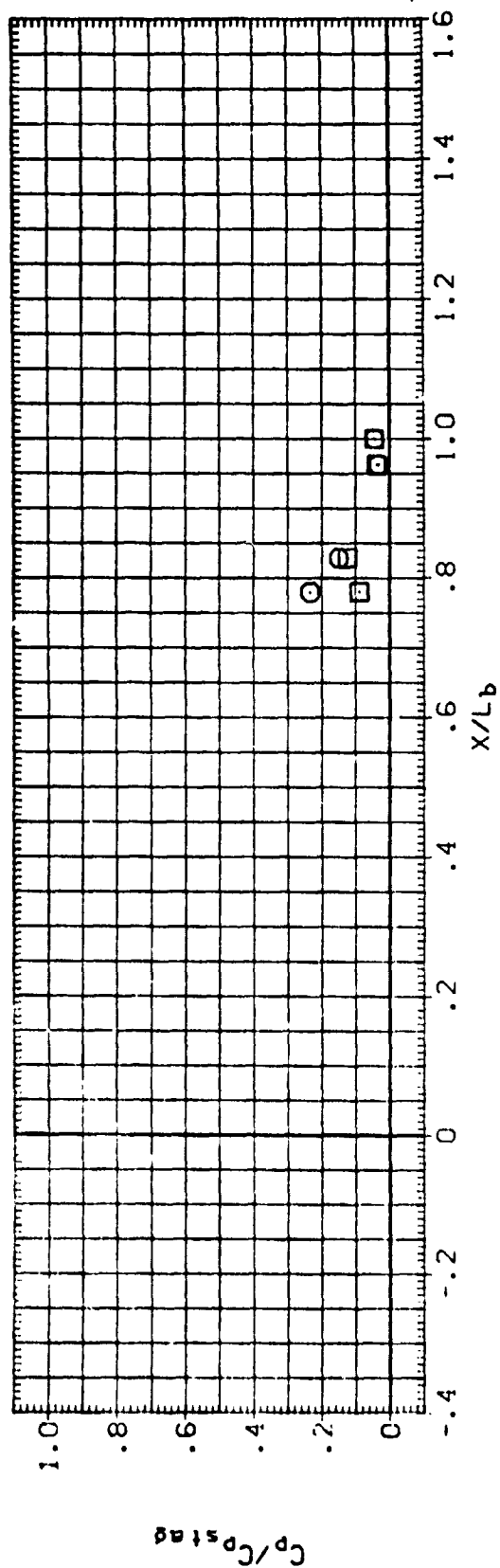


FIG. 40 VARIATION OF C_p/C_{ps} ON THE ISOLATED ORBITER, FUSELAGE, BETA=-5, RN/L= 3.0

(R038C0) UPWT :059 (IH4) 01 ALONE ORBITER FUSELAGE
 SYMBOL ALPHA X/LB MACH
 -5.000 .200 3.700
 .000 .100

PARAMETRIC VALUES
 3.000 BETA

RN/L

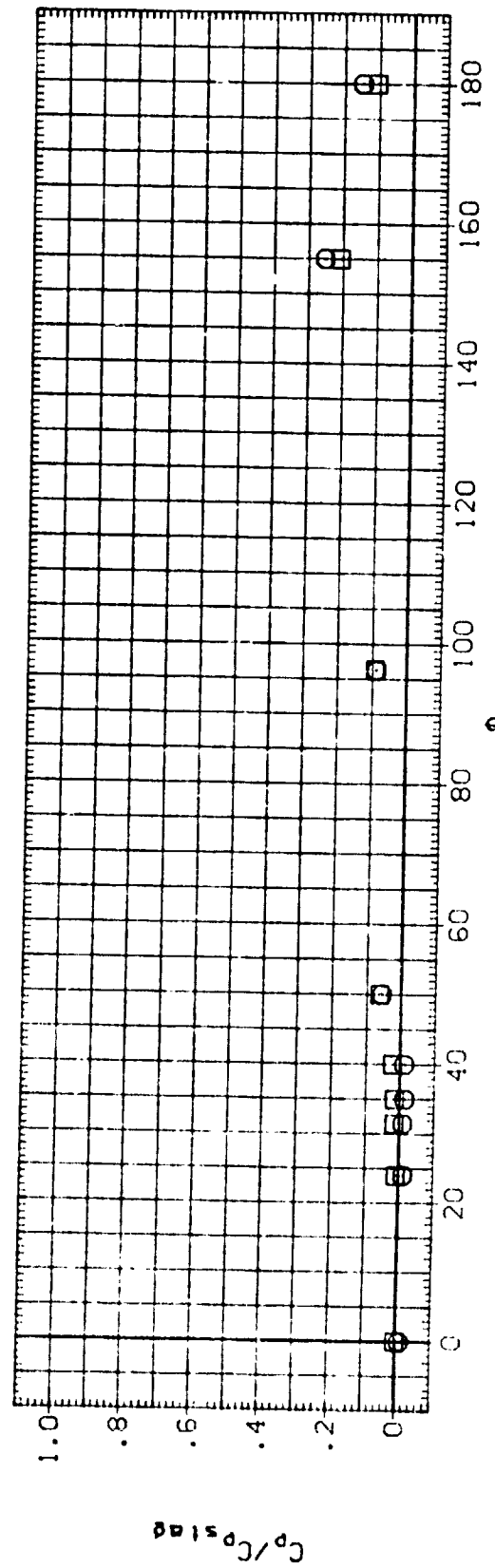
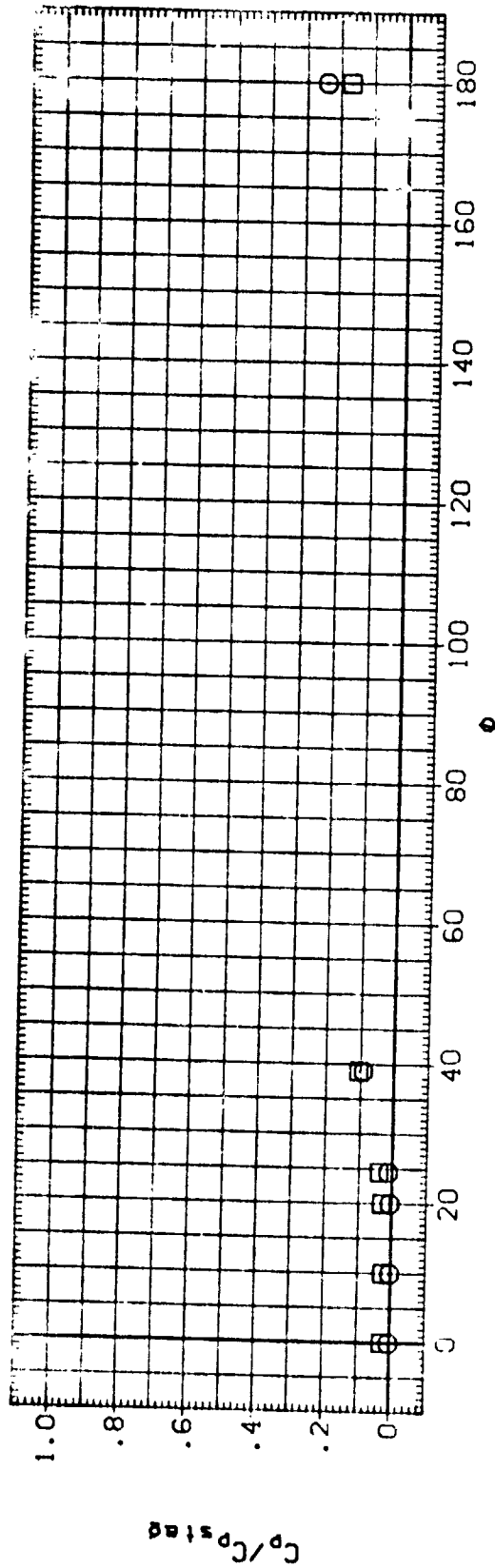


FIG. 40 VARIATION OF C_p/C_{ps} ON THE ISOLATED ORBITER, FUSELAGE.
 BETA=-5. RN/L= 3.0

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ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(RQ38CD)

PARAMETRIC VALUES
3.000 BETA -5.000

RN/L

MACH 3.700

X/LB .600 .300

ALPHA -5.000 .000

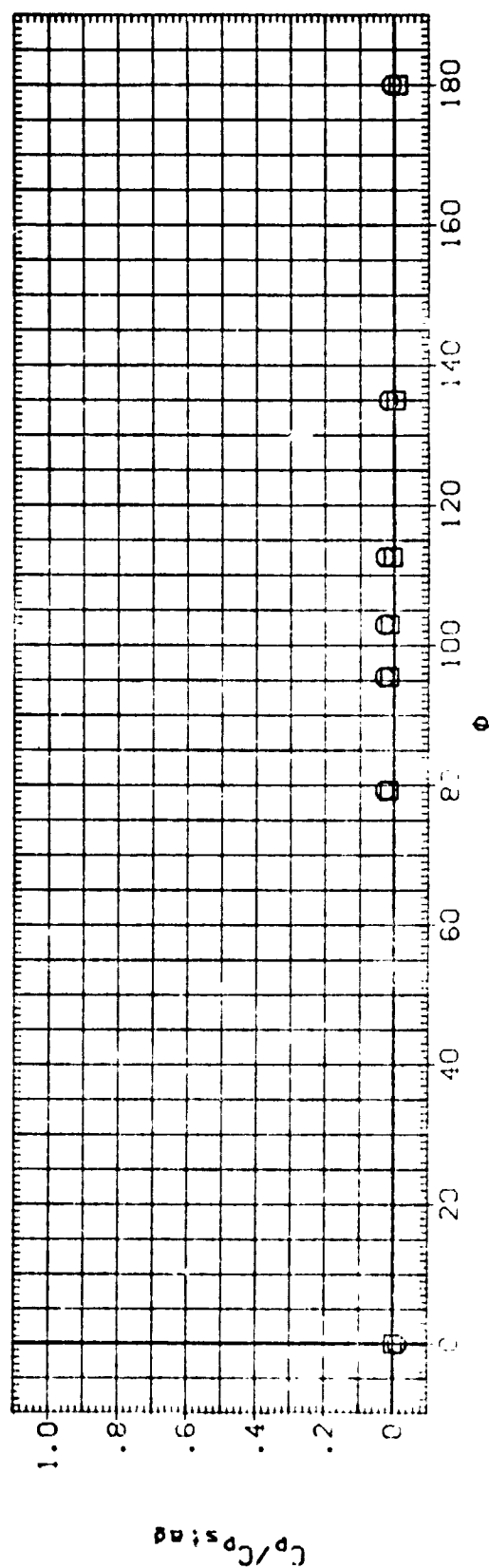
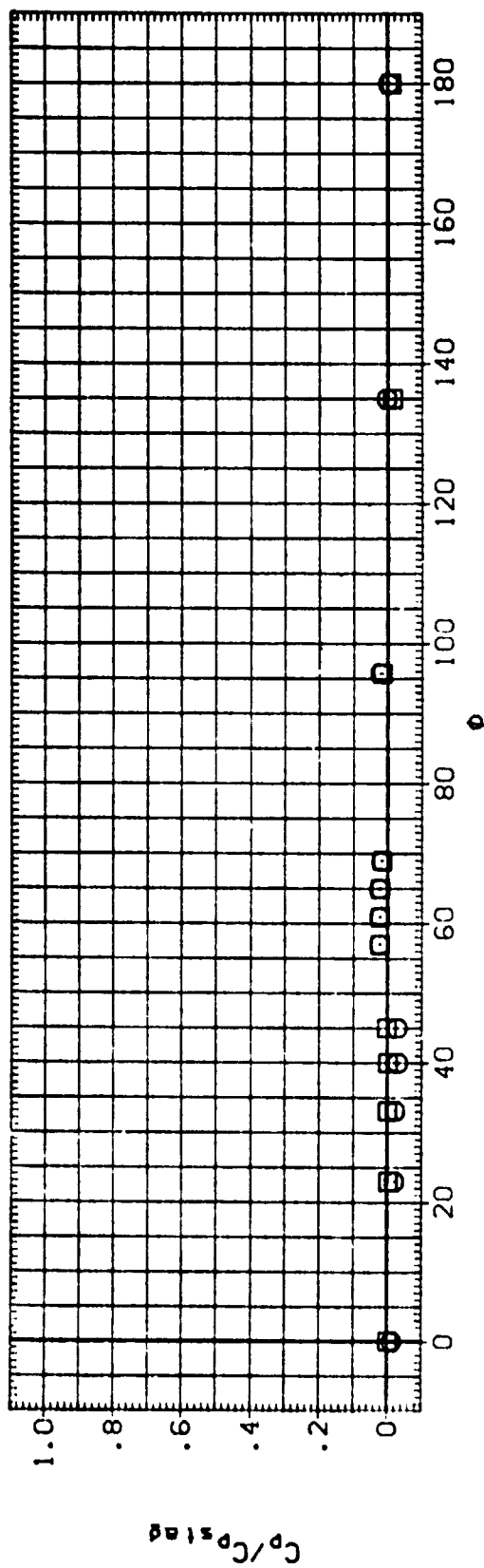


FIG. 40 VARIATION OF C_p/C_{psi} ON THE ISOLATED ORBITER. FUSELAGE.
BETA=-5. RN/L= 3.0

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(R03BCD)

SYMBOL ALPHA X/LB MACH
 -5.000 .200 4.500
 .000 .100

PARAMETRIC VALUES
 3.000 BETA -5.000

RN

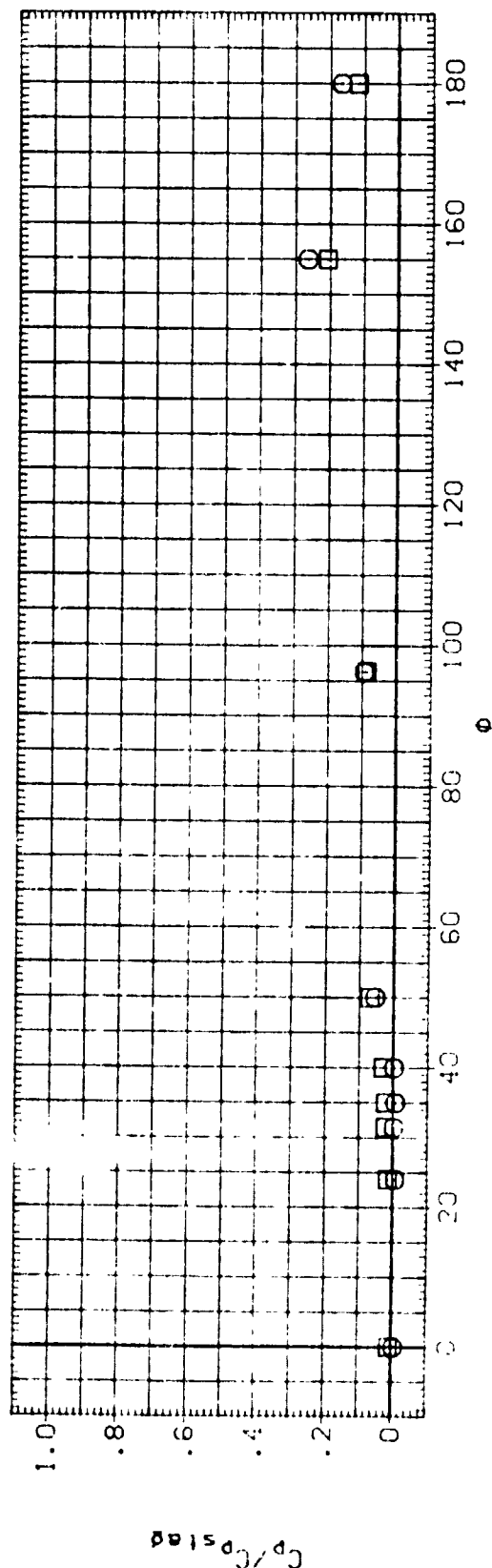
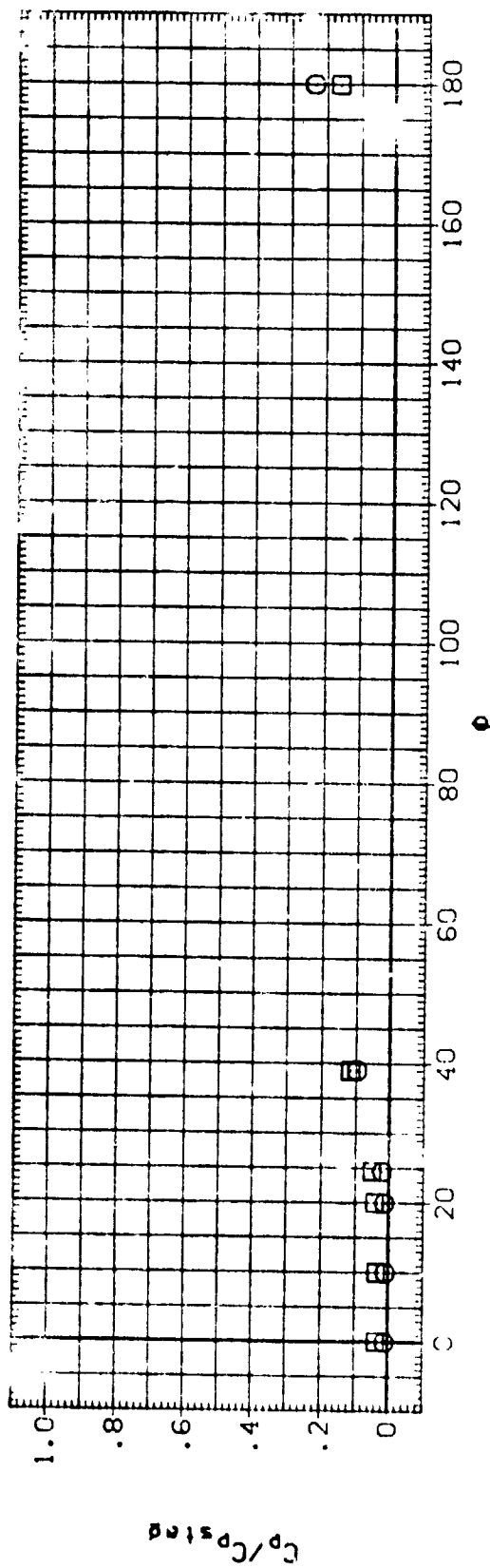


FIG. 40 VARIATION OF C_p/C_{ps} ON THE ISOLATED ORBITER. FUSELAGE.
 BETA=-5, RN/L= 3.0

(R038CD) UPWT 1059 (IH4) 01 ALONE ORBITER FUSELAGE

SYMBOL	ALPHA	X/L	MACH	RN/L	PARAMETRIC VALUES
0	-5.0°	.600	4.600		3.000 BETA
0	.000	.300			-5.000

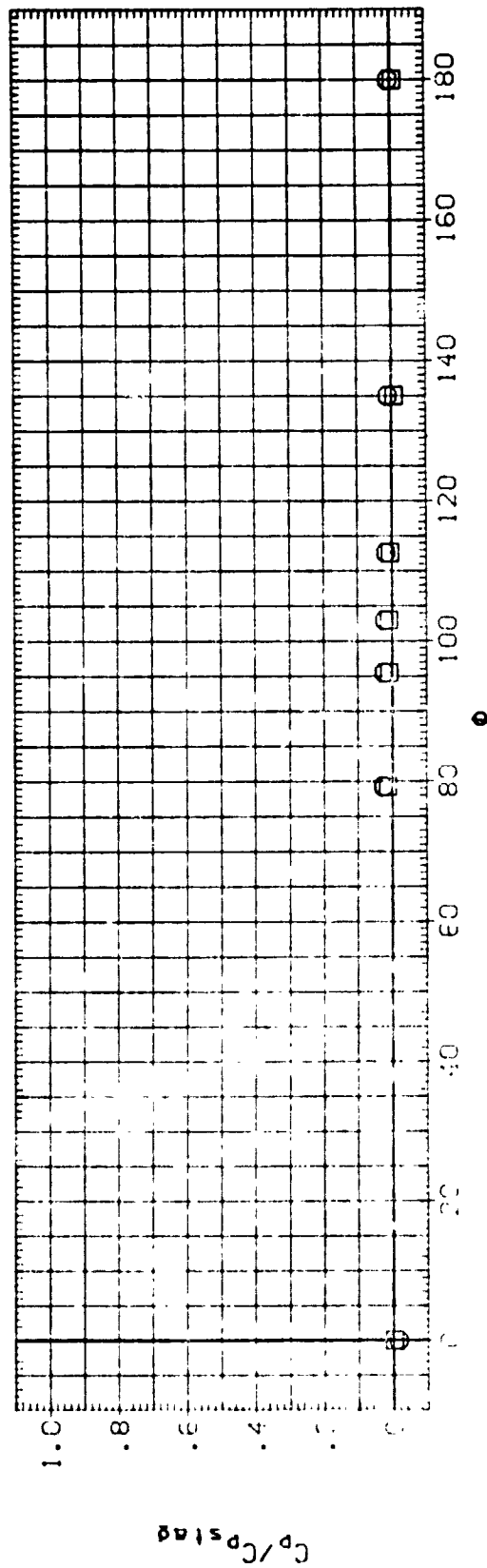
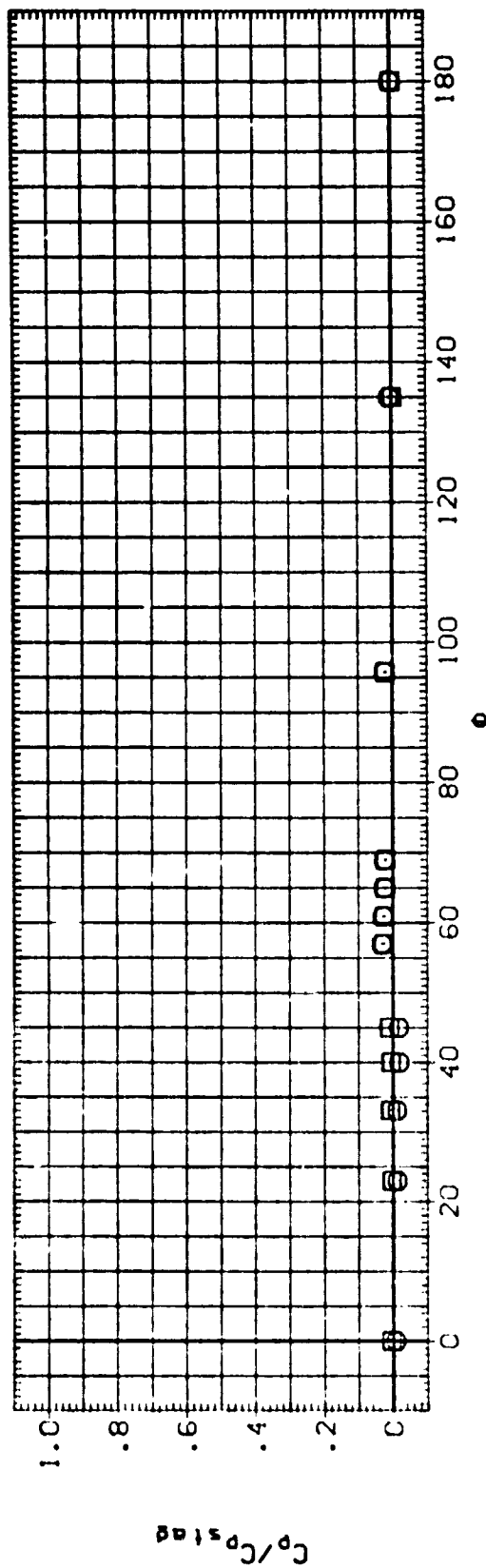


FIG. 40 VARIATION OF C_p/C_{pstag} ON THE ISOLATED ORBITER FUSELAGE.
BETA = -5. RN/L = 3.0

ORB. LOWER WING

UPWT 1059 (IH4) 01 ALONE

(R03LCD)

SYMBOL ALPHA 2Y/B₁ MACH
-5.000 .400 3.750
.000 .250

PARAMETRIC VALUES
RN/L 3.000 B/LA

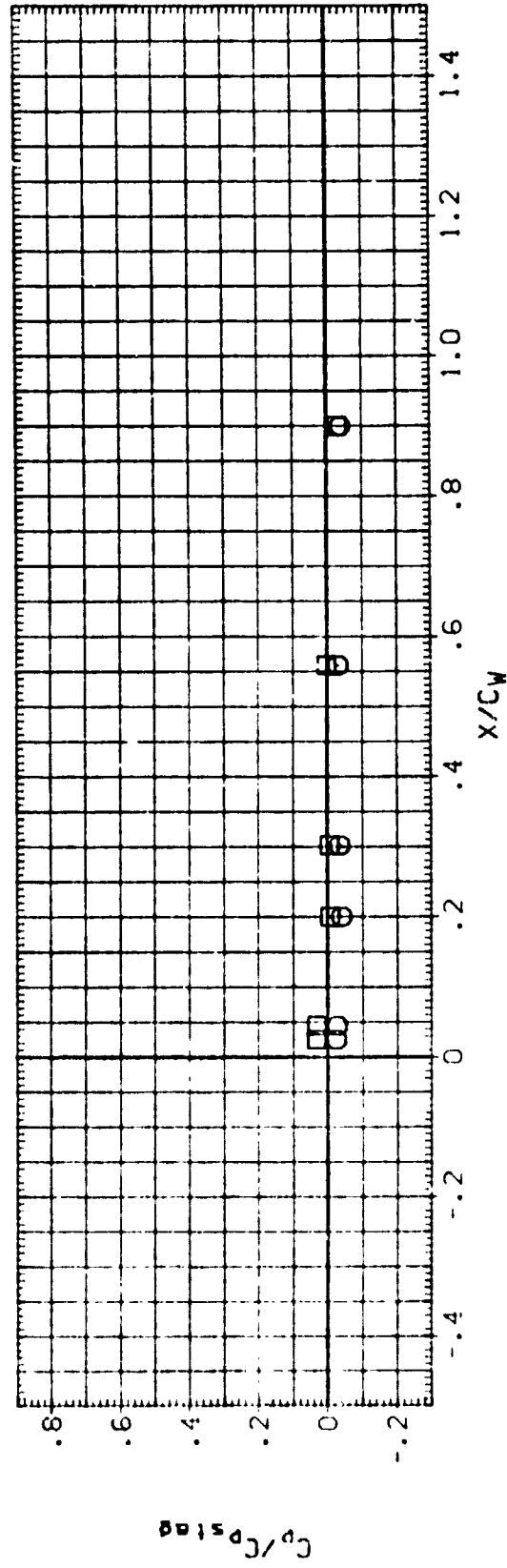
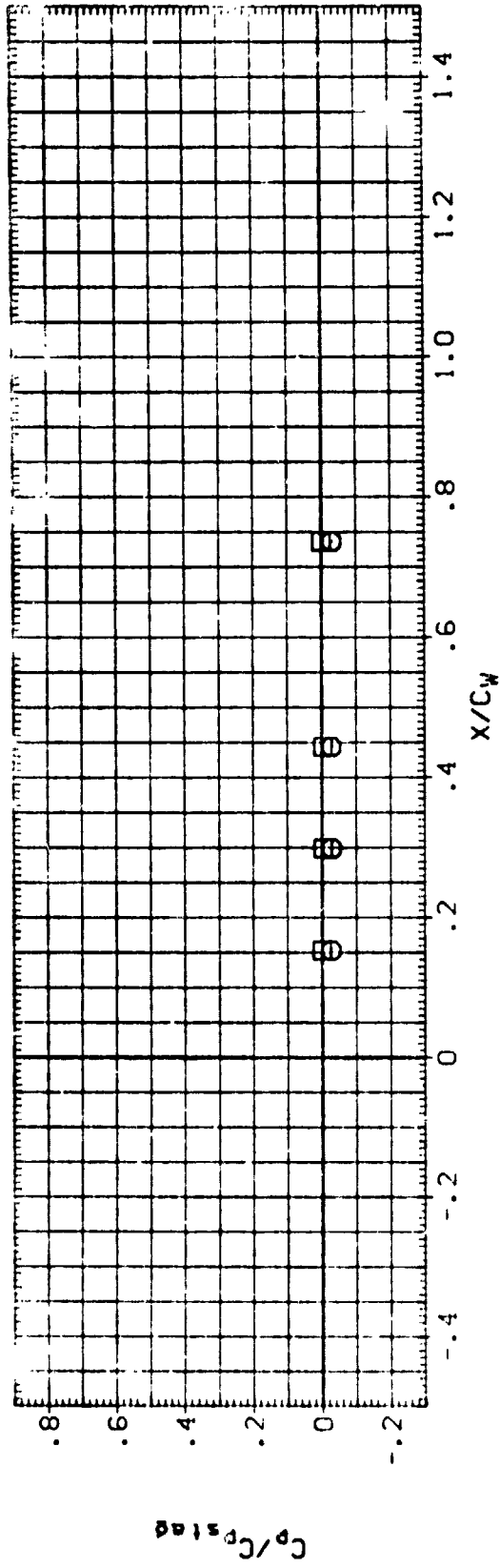


FIG. 41 VARIATION OF CP/CPS ON THE ISOLATED ORBITER, LOWER WING.
BETA=-5. RN/L= 3.0

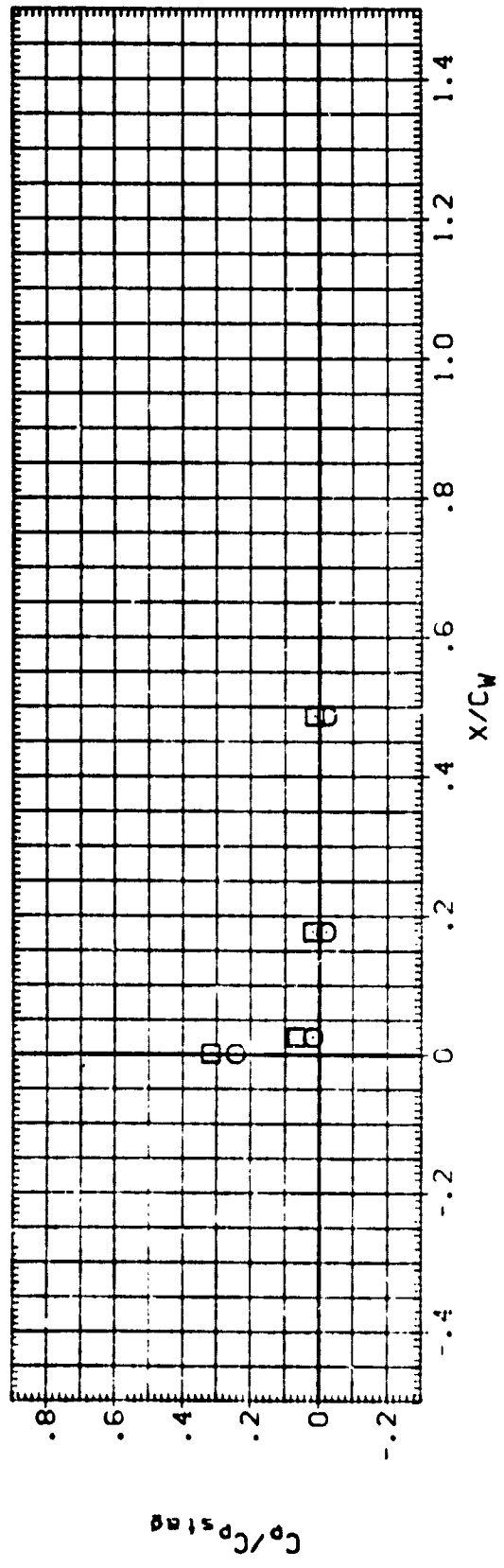
ORB. LOWER WING

(R03LCD) UPWT 1059 (1H4) 01 ALONE

PARAMETRIC VALUES
3.000 BETA -5.000

RN/L

SYMBOL ALPHA 2V/B* MACH 3.000
-5.000 .600 .500



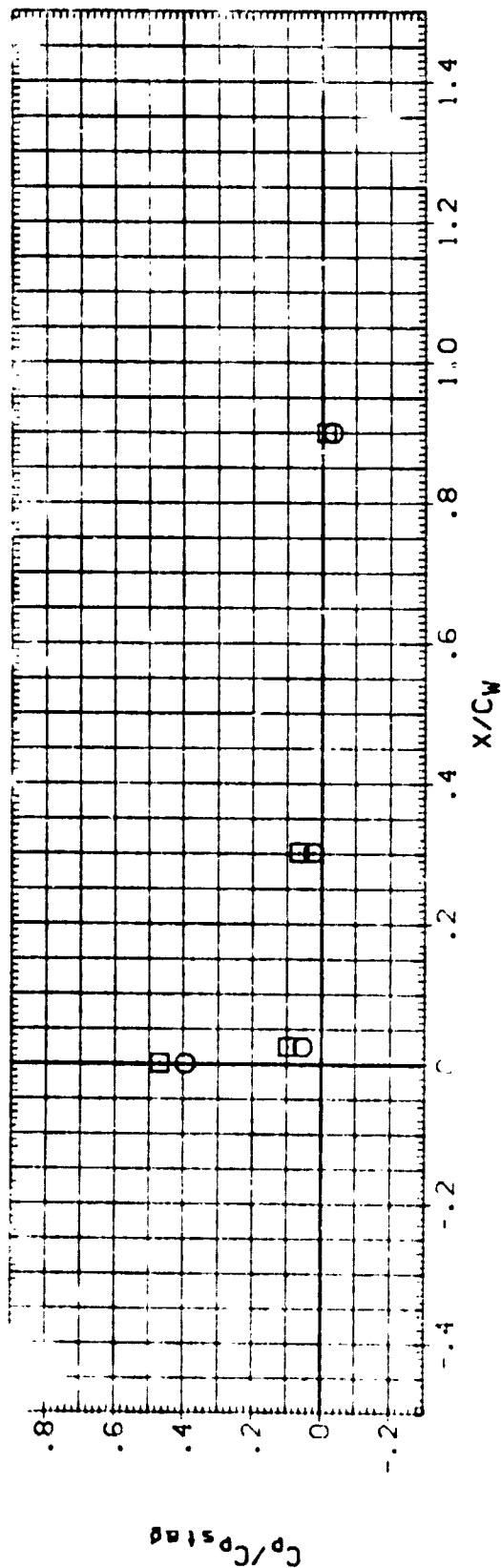
ORB. LOWER WING

UPWT 1059 (IH4) 01 ALONE

(RQ3LCD) SYMBO ALPHA -5.000
2Y/B 85.000
MACH 3.700
RN/L 3.000

PARAMETRIC VALUES
3.000 BETA

RN/L



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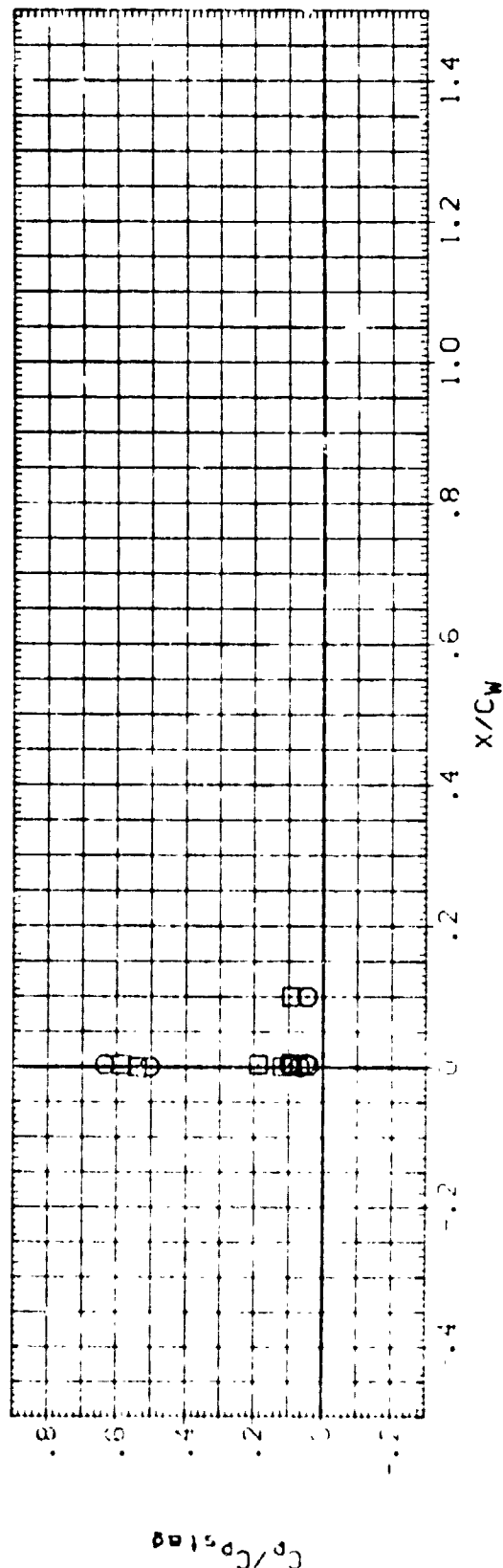


FIG. 41 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. LOWER WING. BETA=-5. RN/L= 3.0

ORB. LOWER WING

(R03LCD) UPWT 1050 (IH4) 01 ALONE

PARAMETRIC VALUES
J.000 BETA -5.000

RN/L

4.600

.400

.250

0

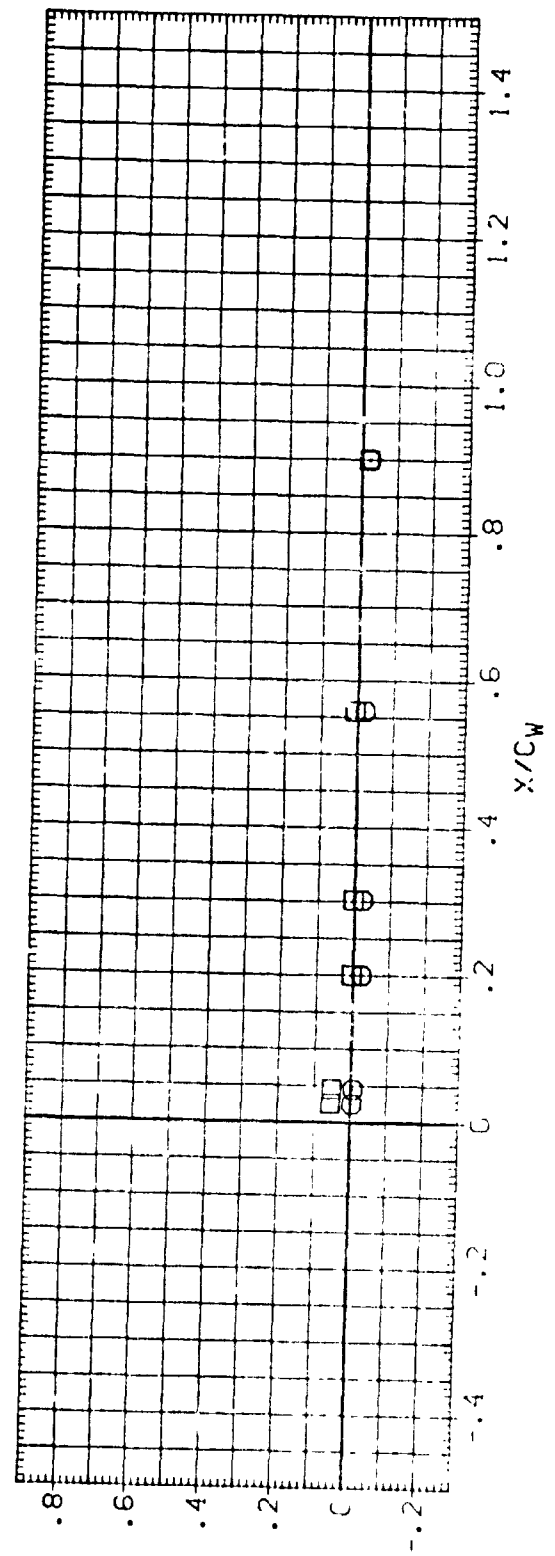
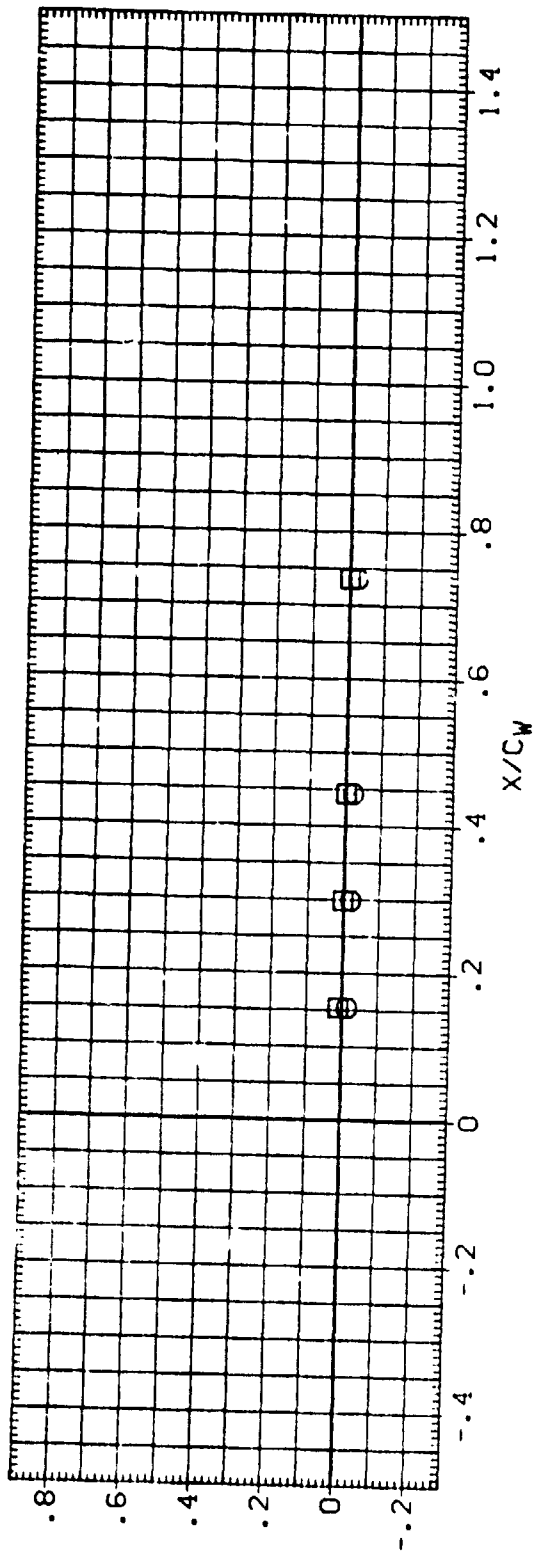


FIG. 41 VARIATION OF CP/CPs ON THE ISOLATED ORBITER, LOWER WING.
BETA=-5, RN/L= 3.0

ORB. LOWER WING

UPWT 1059 (IH4) 01 ALONE

(R03LCD) SYMBOL ALPHA -5.000
2Y/BV .600
MACU 4.500

PAR/ETPIC VALUE
3.170 RE A

RN/L

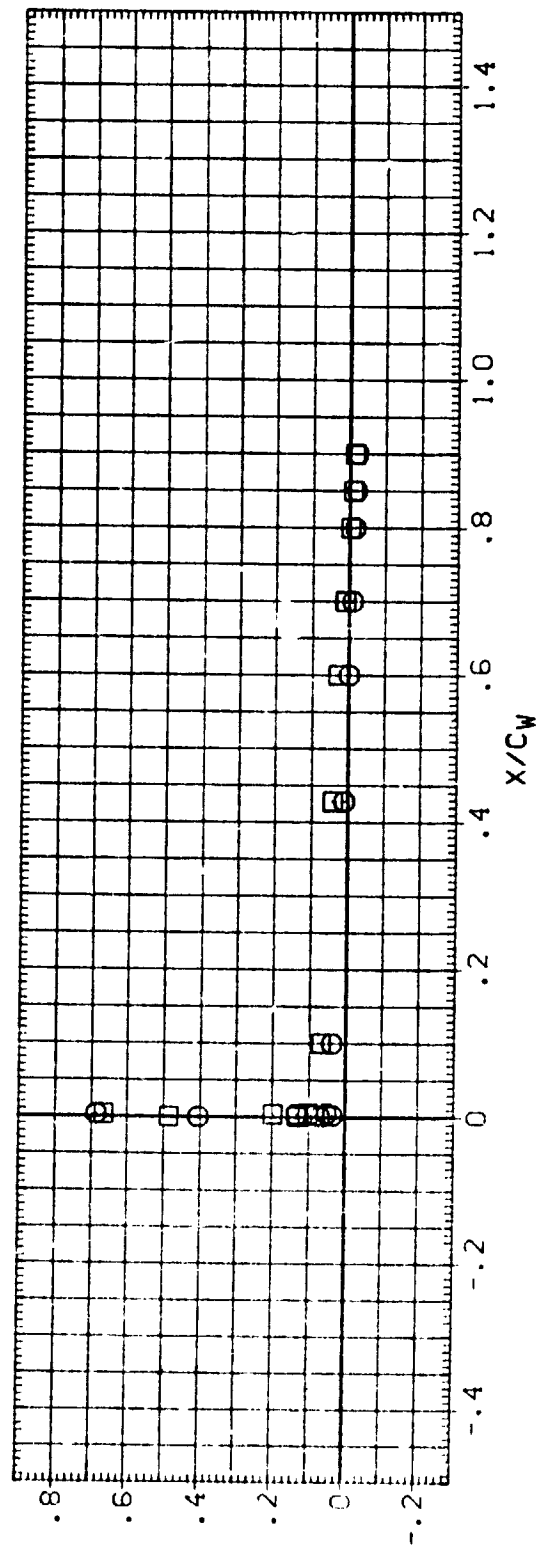
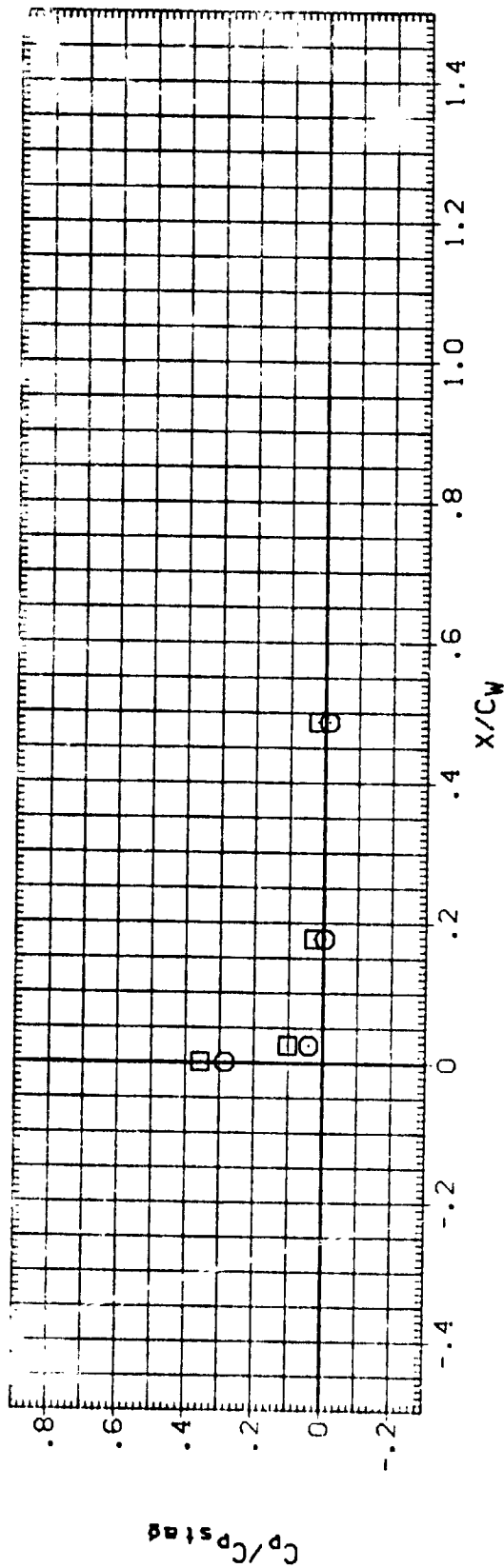


FIG. 41 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. LOWER WING.
BETA=-5, RN/L= 3.0

(R03LCD) UPWT 1059 (IH4) 01 ALONE ORB. LOWER WING
 SYMBOL ALPHA 2Y/DW MACH 4.600
 -5.000 .850
 .000 .750
 PARAMETRIC VALUES
 RN/L 3.000 BETA -5.000

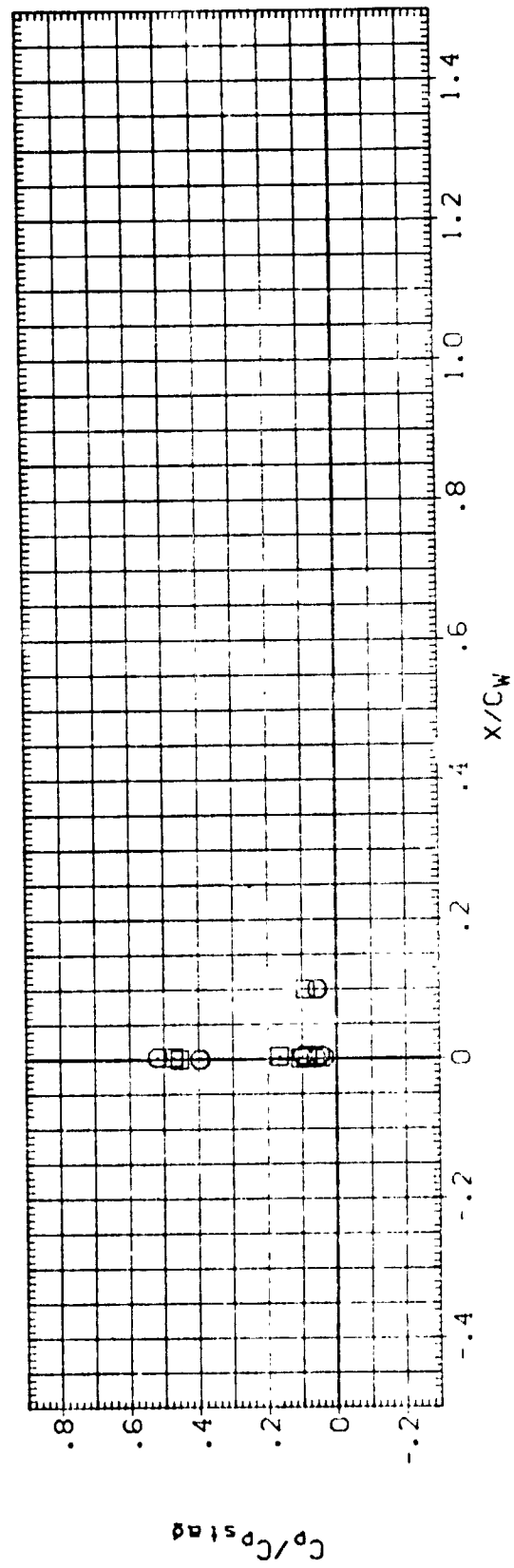
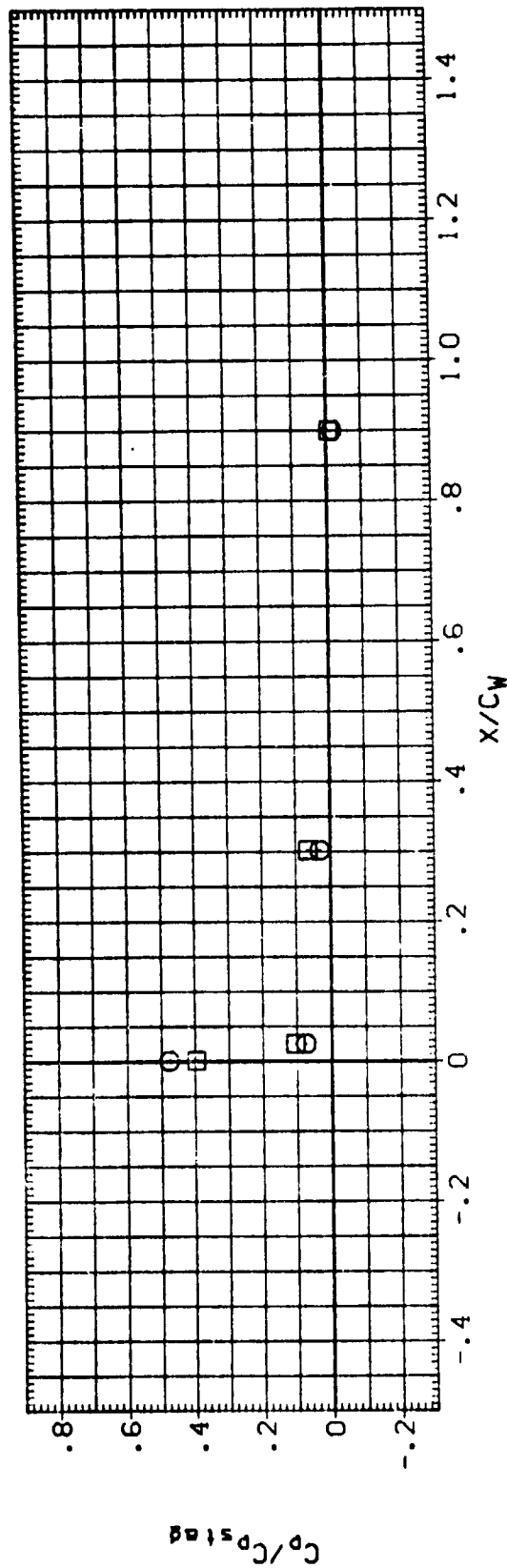


FIG. 41 VARIATION OF C_D/C_{Dstagn} ON THE ISOLATED ORBITER, LOWER WING, BETA=-5, RN/L= 3.0

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

(R03UCD) UPWT 1059 (IH4) 01 ALONE ORB. UPPER WING
SYMBOL ALPHA ZY/RV MACH
-5.000 .800 3.700
-5.000 .600 400

PARAMETRIC VALUES
RN/L 3.000 BETA -5.0

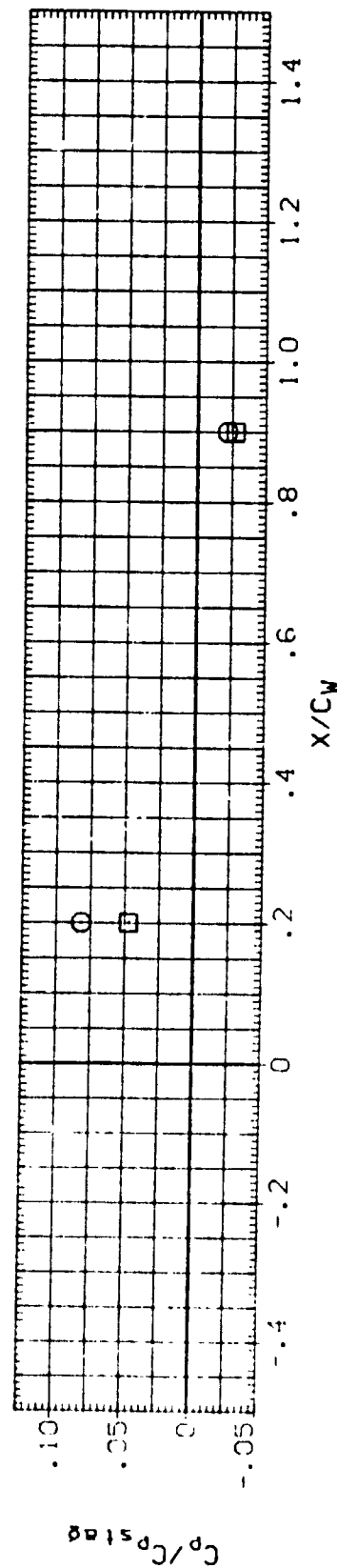
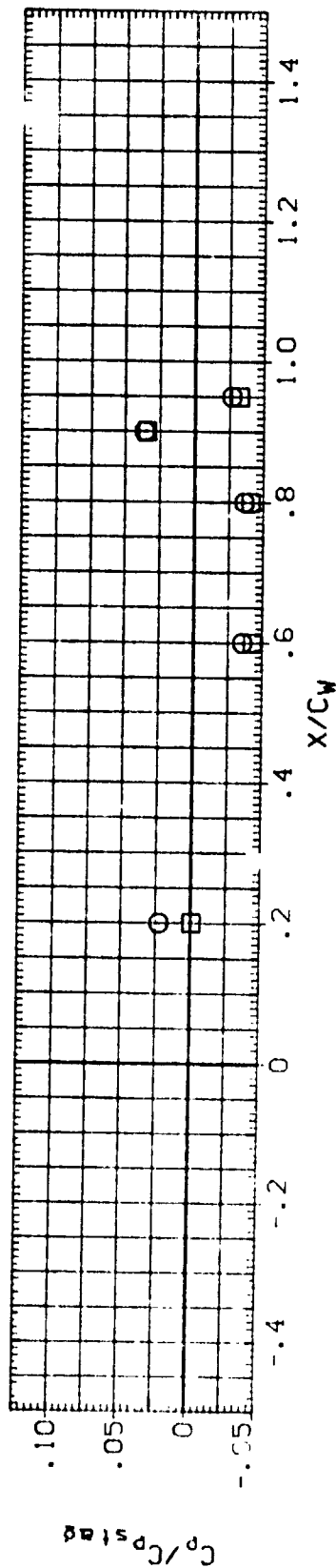
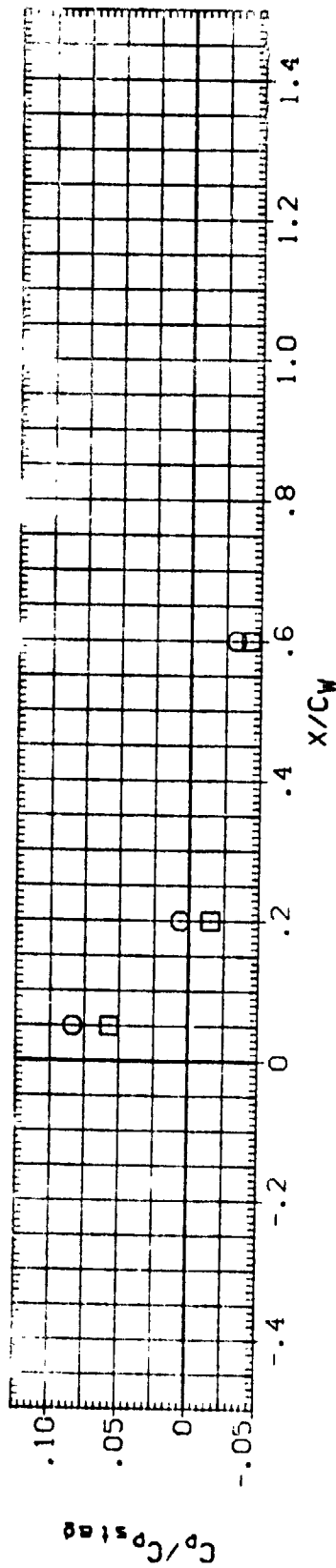


FIG. 42 VARIATION OF CP/CPs ON THE ISOLATED ORBITER, UPPER WING.
BETA=-5. RN/L= 3.0

ORB. UPPER WING

(R03UCD) UPWT 1059 (IH4) 01 ALONE

SYMBOL \square ALPHA -5.0° MACH 4.600
 .800
 .600
 .400

RN/L 3.000
 BETA -5.000

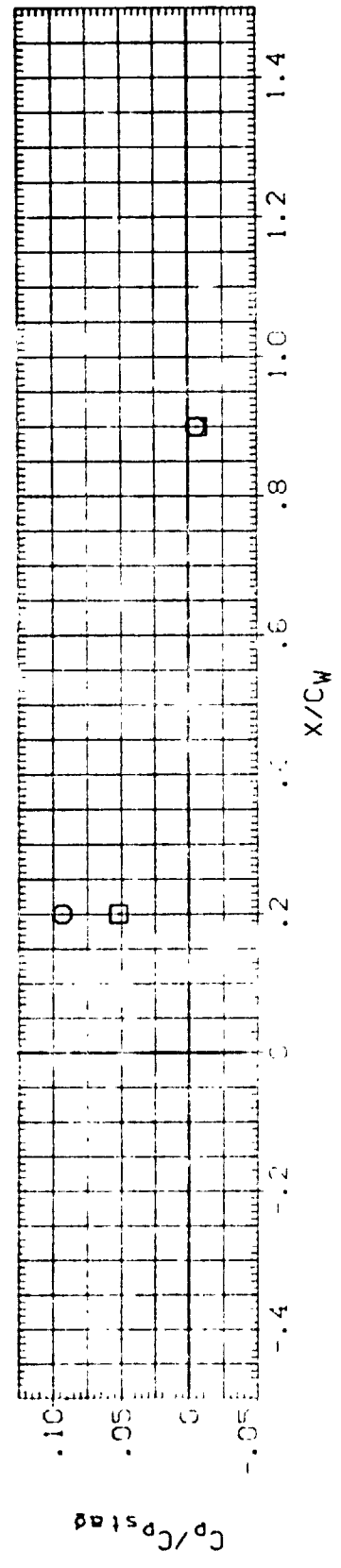
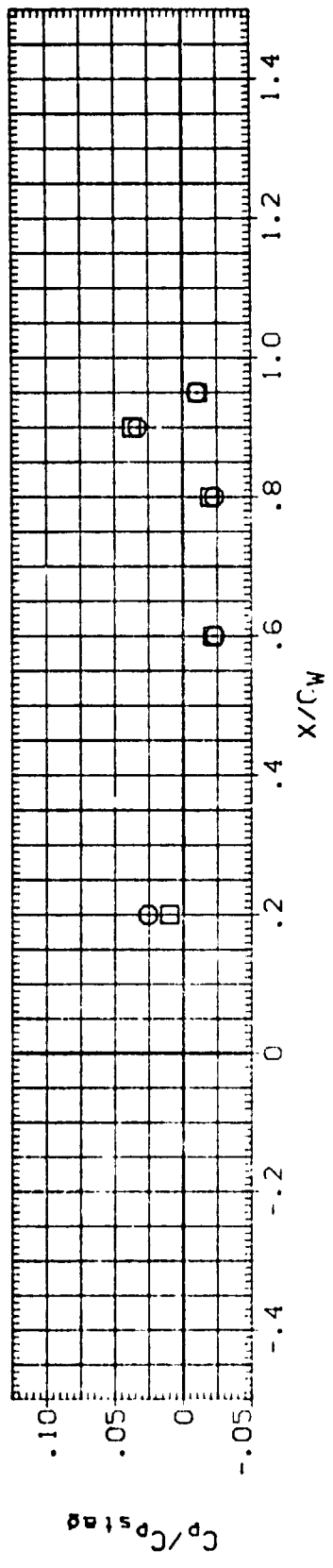
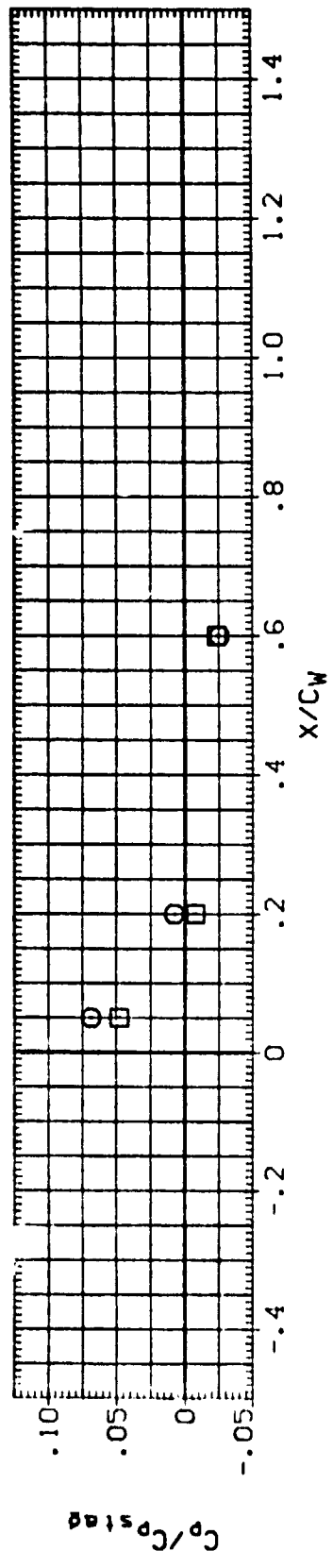


FIG. 42 VARIATION OF C_p/C_{pstag} ON THE ISOLATED ORBITER, UPPER WING. BETA -5° , RN/L = 3.0

ORB. VERT. TAIL

(R03VCD) UPWT 1059 (IH4) 01 ALONE

SYMBOL ALPHA Z/BV MACH
 -5.000 .299 3.700
 .000 .532
 .765

PARAMETRIC VALUES
 3.000 BETA
 5.00

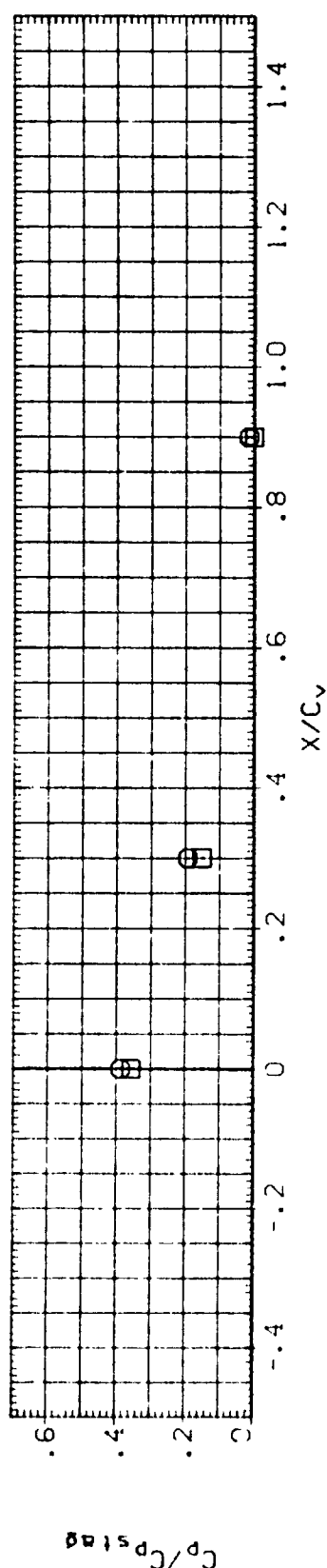
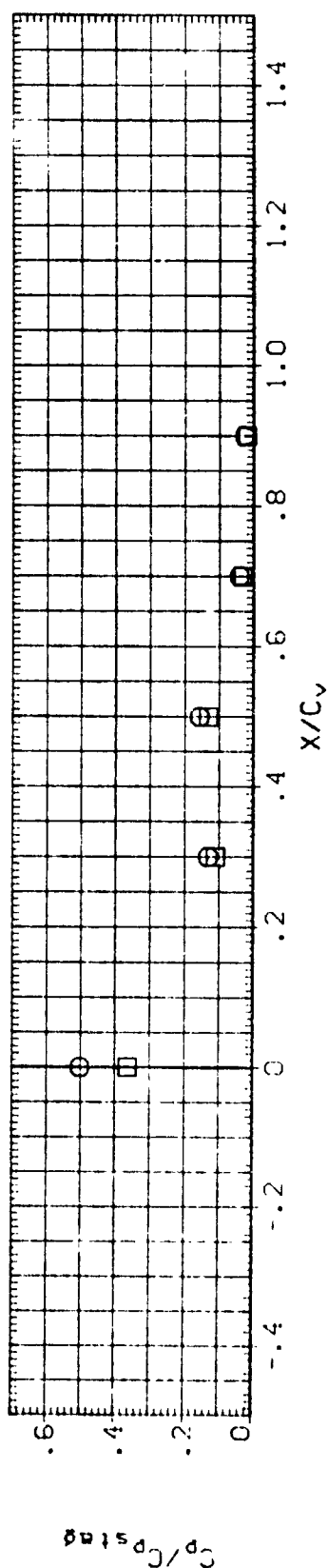
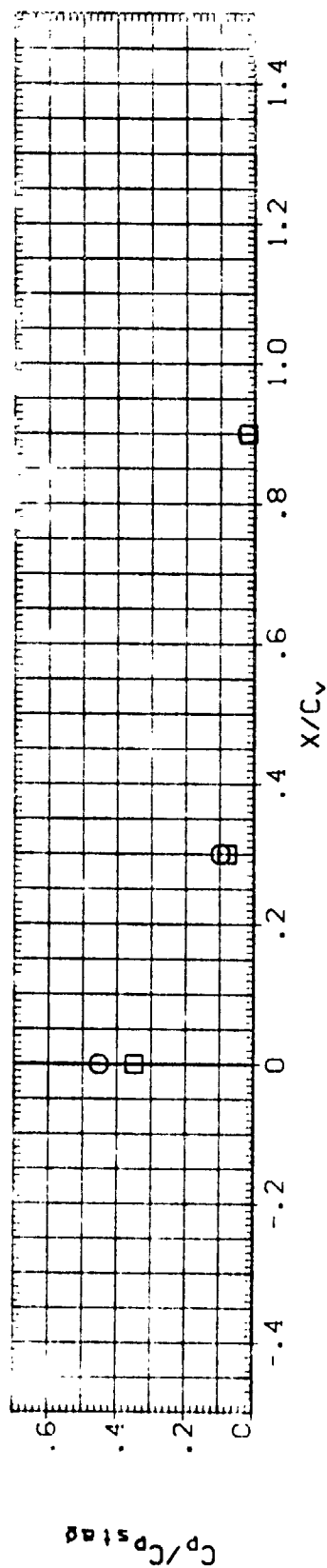


FIG. 43 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. VERTICAL TAIL.
 BETA=-5. RN/L= 3.0

ORB. VERT. TAIL

UPWT 1059 (IH4) 01 ALONE

PARAMETRIC VALUES
3.000 BETA -5.000

RN/L

SYMBOL ALPHA Z/BV MAC
-5.000 .293 4.600
.000 .532
.765

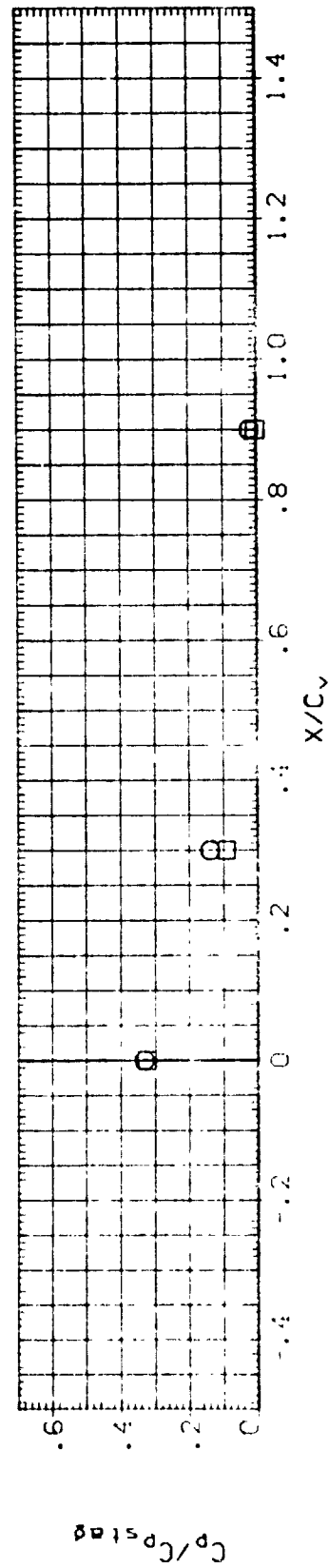
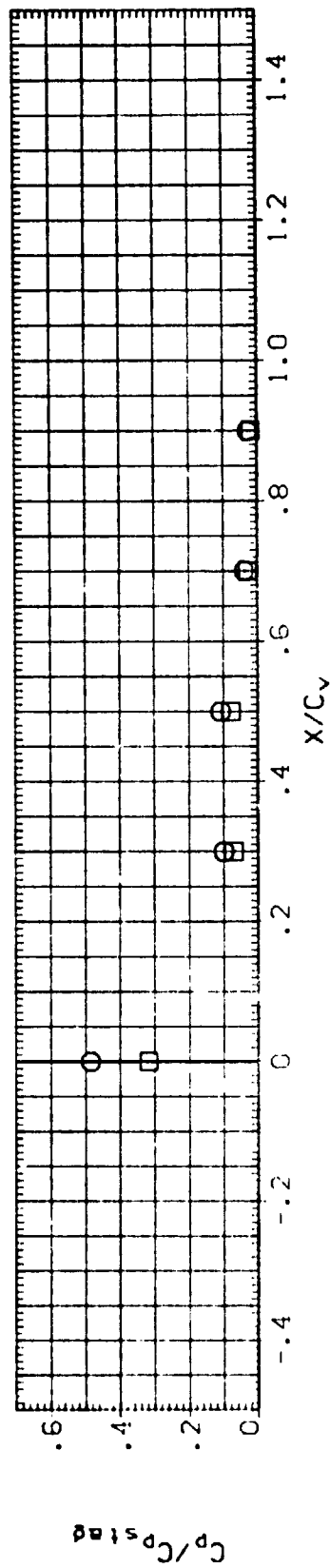
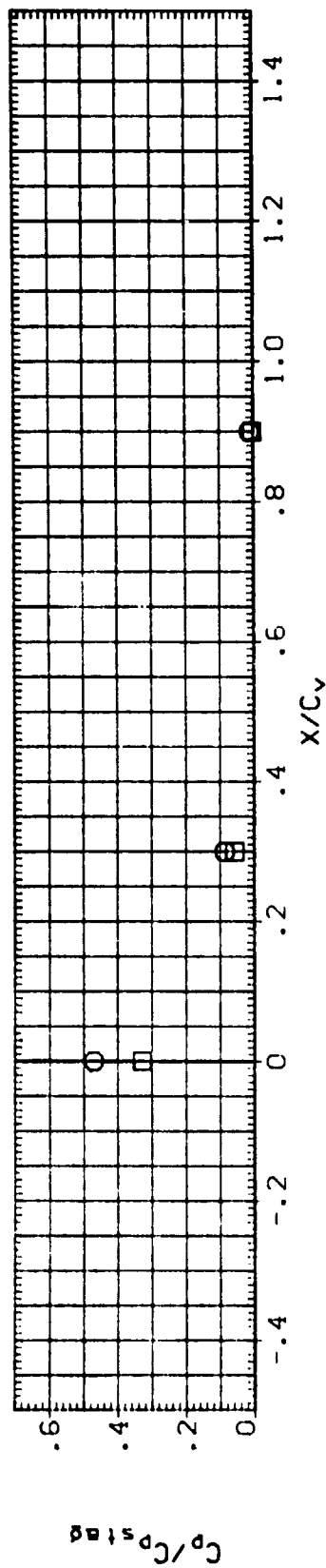


FIG. 43 VARIATION OF CP/CLS ON THE ISOLATED ORBITER. VERTICAL TAIL.
BETA=-5. RN/L= 3.0

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(R038CA) ALPHA
SYMBOL 0.000
5.000
10.000
20.000

PHI 95.000
MACH 2.360
RN/L 1.200
BET 0.000

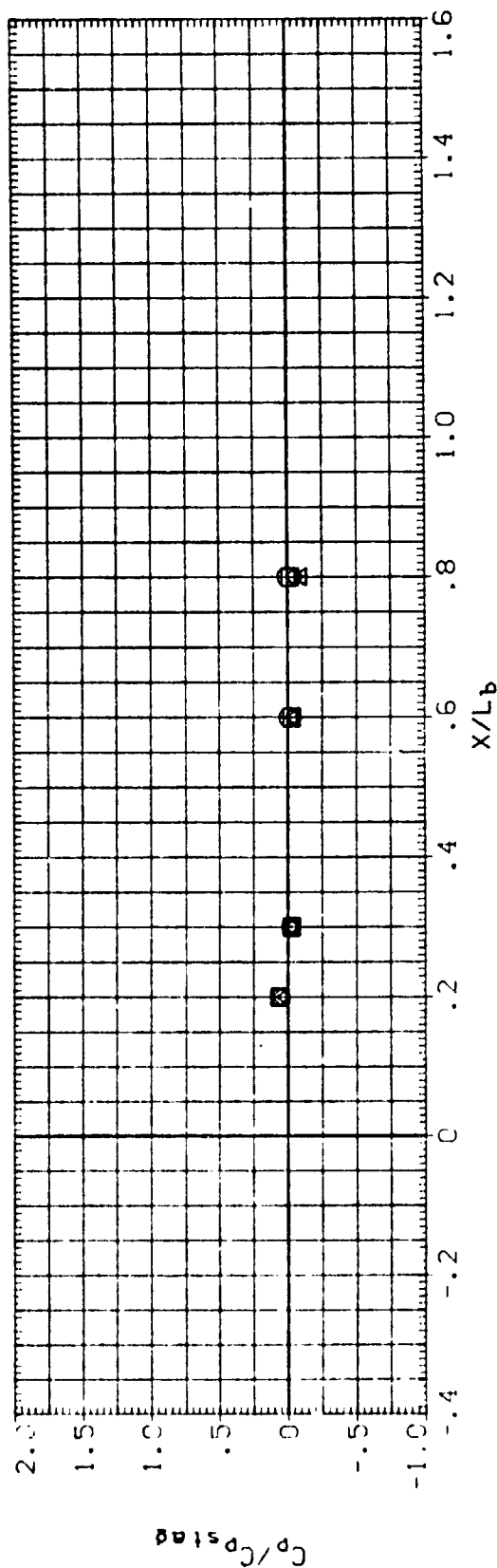
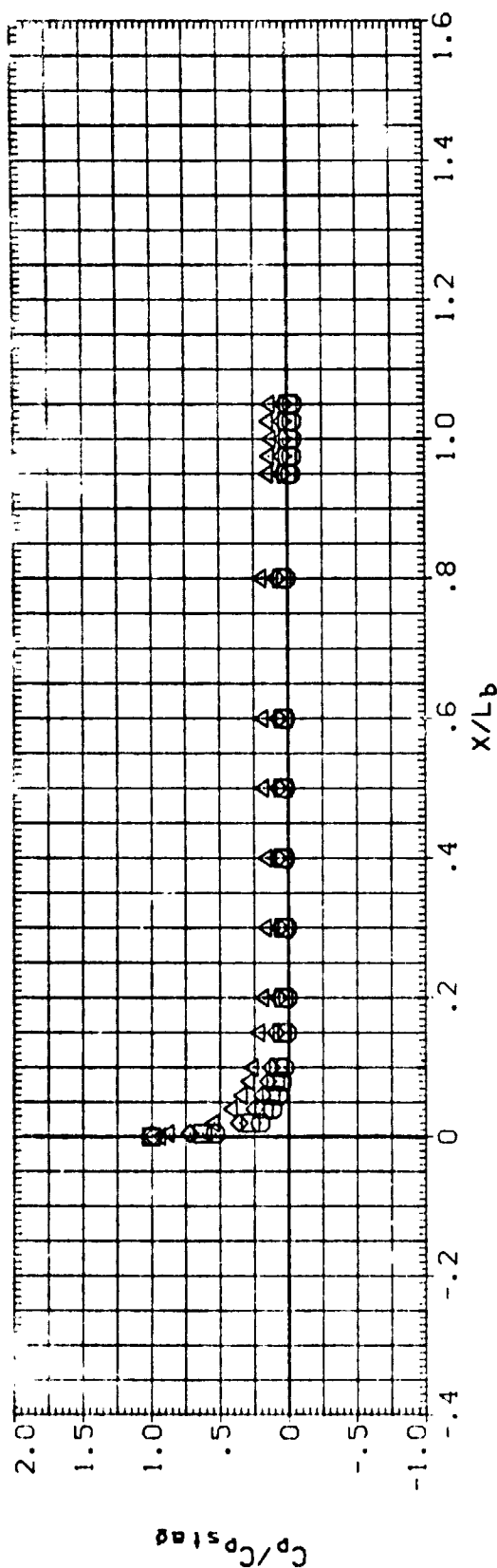


FIG. 44 VARIATION OF CP/CPs ON THE ISOLATED ORBITER, FUSELAGE.
BETA= 0. RN/L= 1.2

(R03BCA) UPWT 1059 (IH4) 01 ALONE ORBITER FUSELAGE

SYMBOL	ALPHA	PHI	MACH	RN/L	PARAMETRIC VALUES
	.000	180.000	2.360		1.200
	5.000	122.700			BETA
	10.000				.000
	20.000				

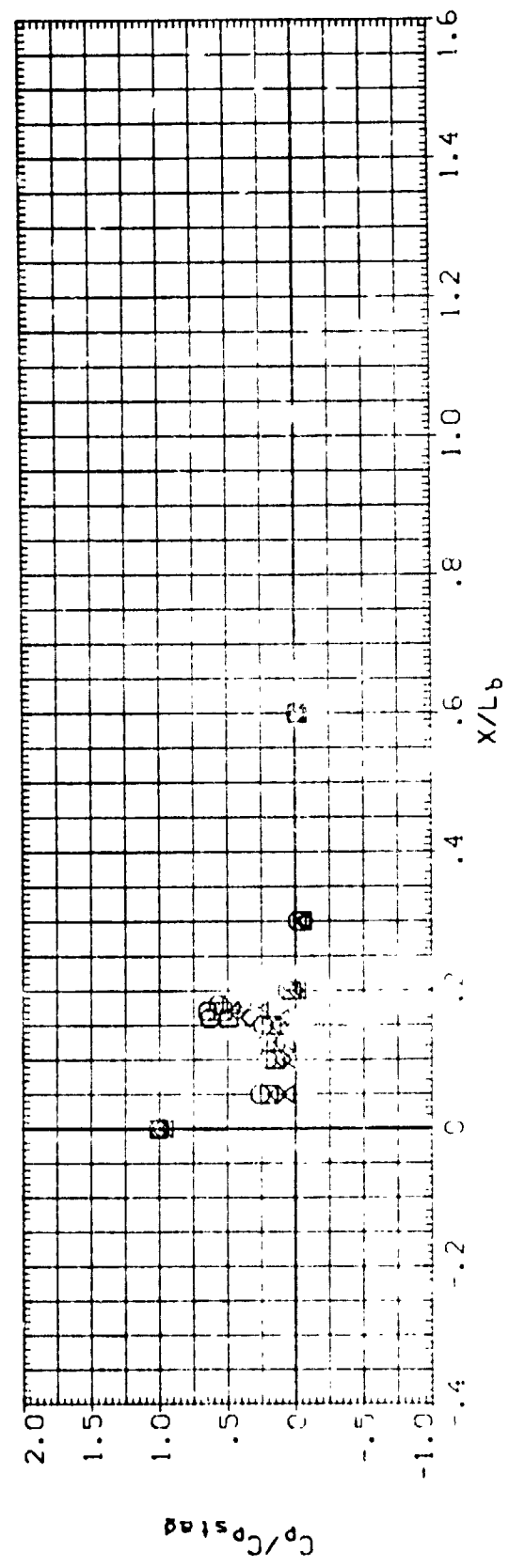
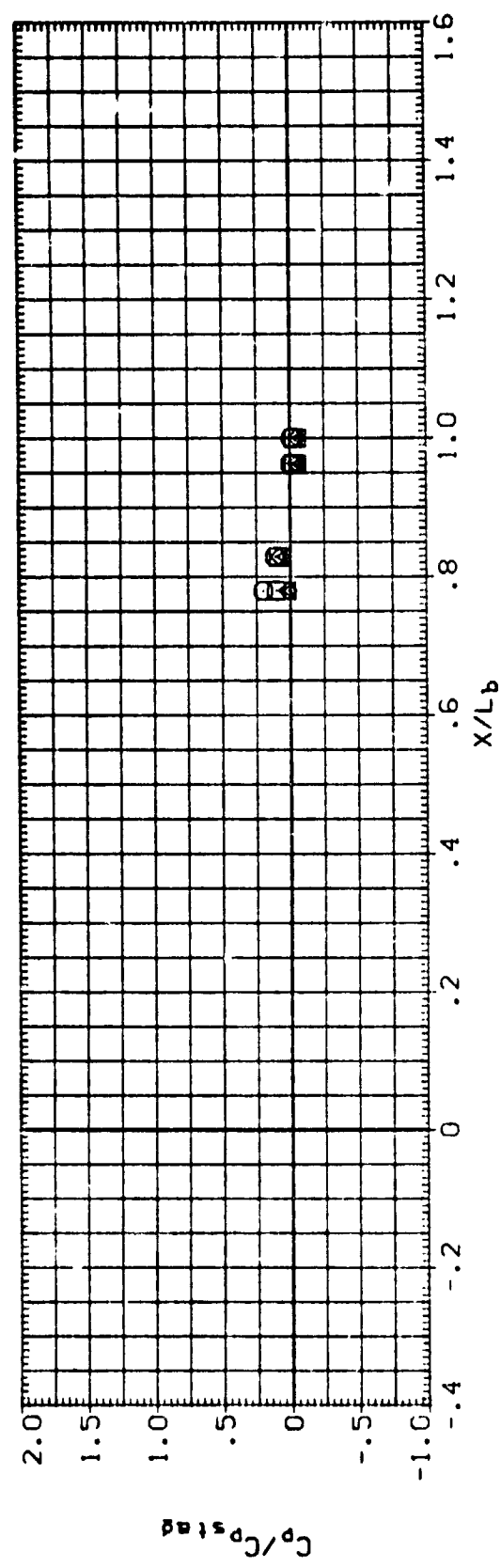


FIG. 44 VARIATION OF COEFFICIENTS ON THE ISOLATED ORBITER, FUSELAGE, BETA= 0, RN/L= 1.2

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(R03BCA) SYPSOL ALPHA
 .000
 5.000
 10.000
 20.000

MACH 2.950

PARAMETRIC VALUES
 1.200 BETA

RN=

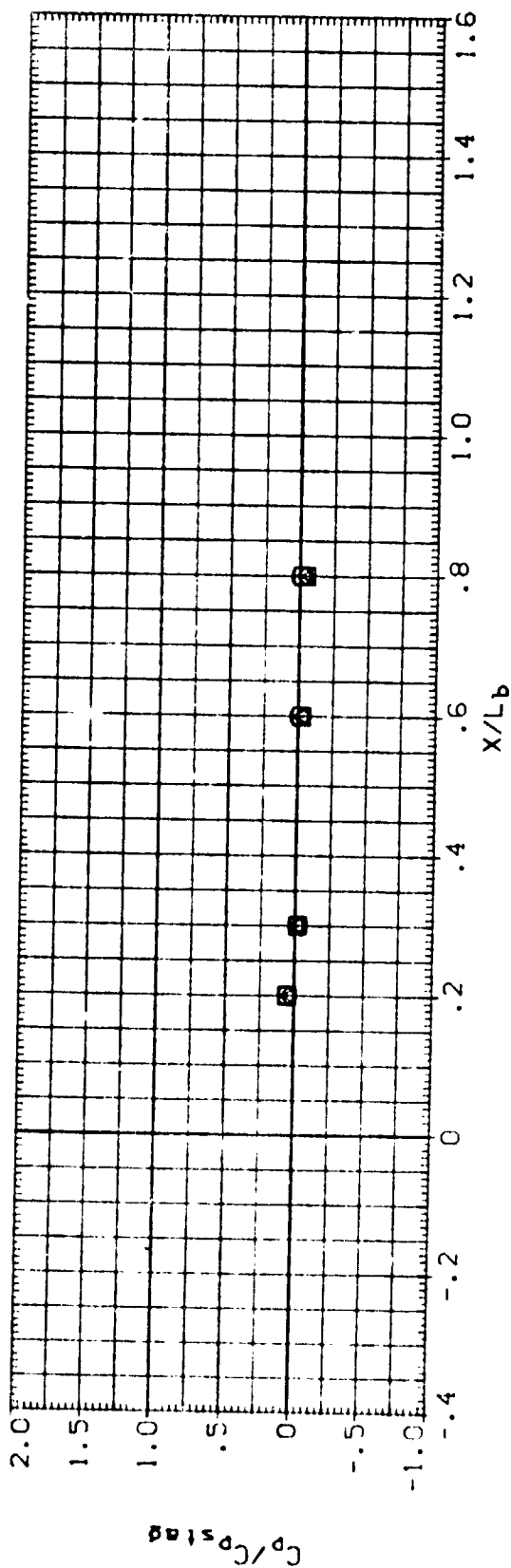
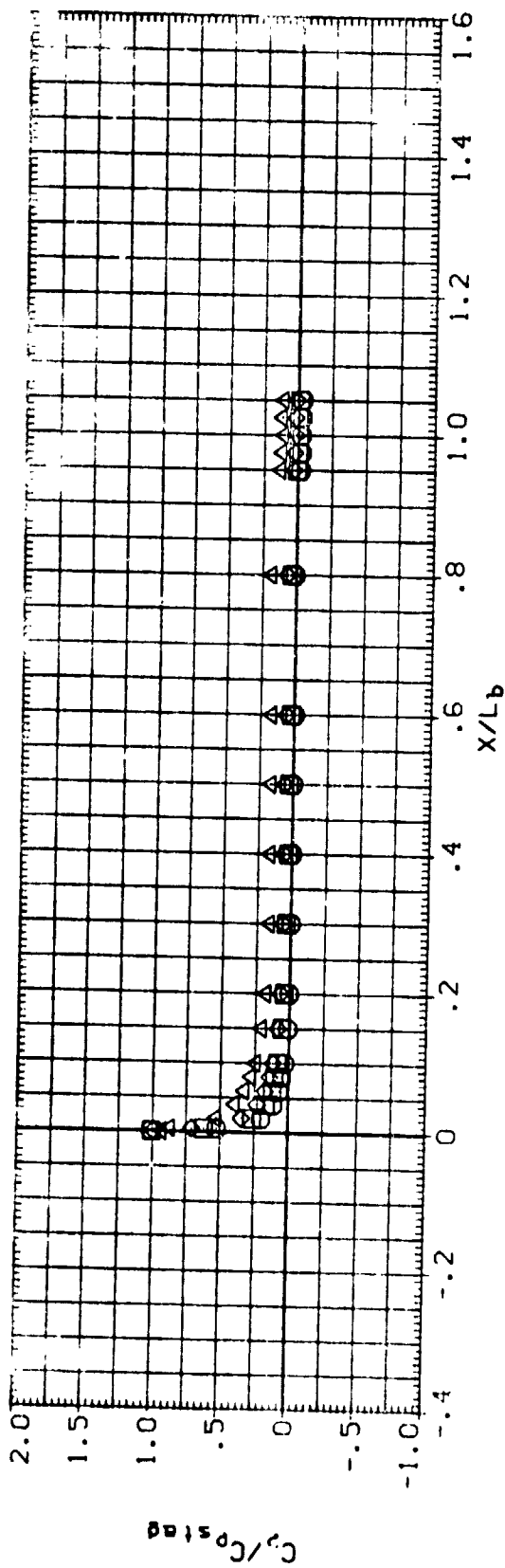


FIG. 44 VARIATION OF CP/CPS ON THE ISOLATED ORBITER, FUSELAGE.
 BETA= 0. RN/L= 1.2

(R03BCA) UPWT 1059 (IH4) 01 ALONE ORBITER FUSELAGE

PARAMETRIC VALUES
1.200 BETA .000

RN/L

PHI
180.000
122.700

ALPHA
-0.000
5.000
10.000
20.000

SYMBOL
X
O

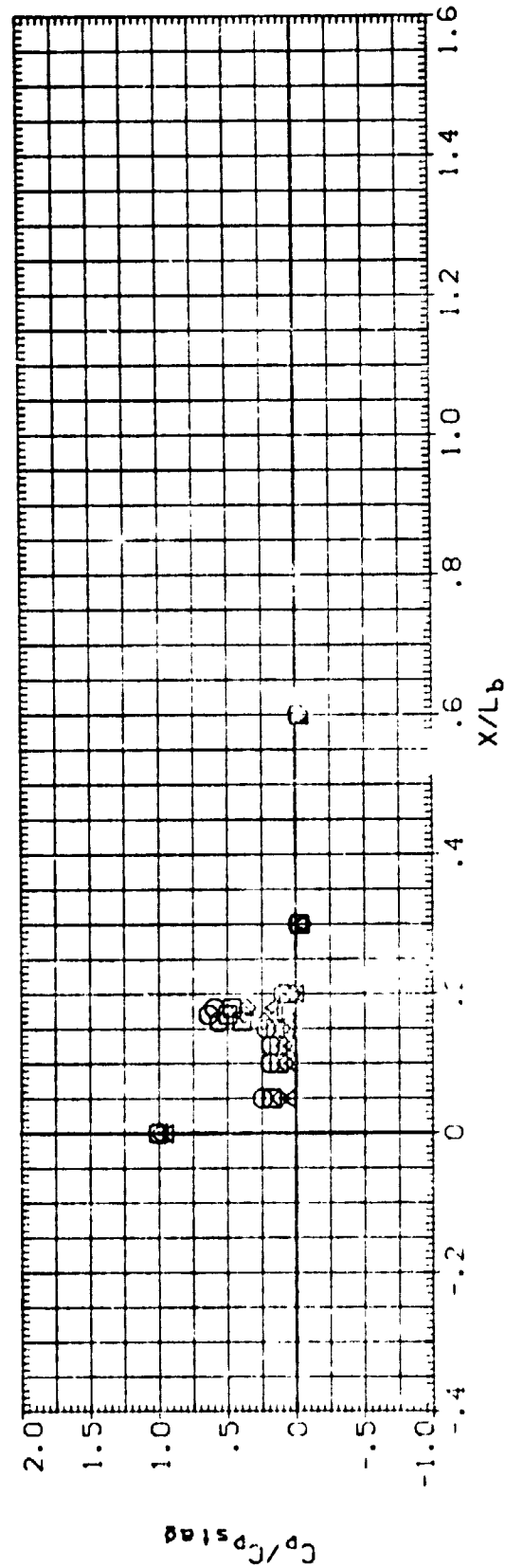
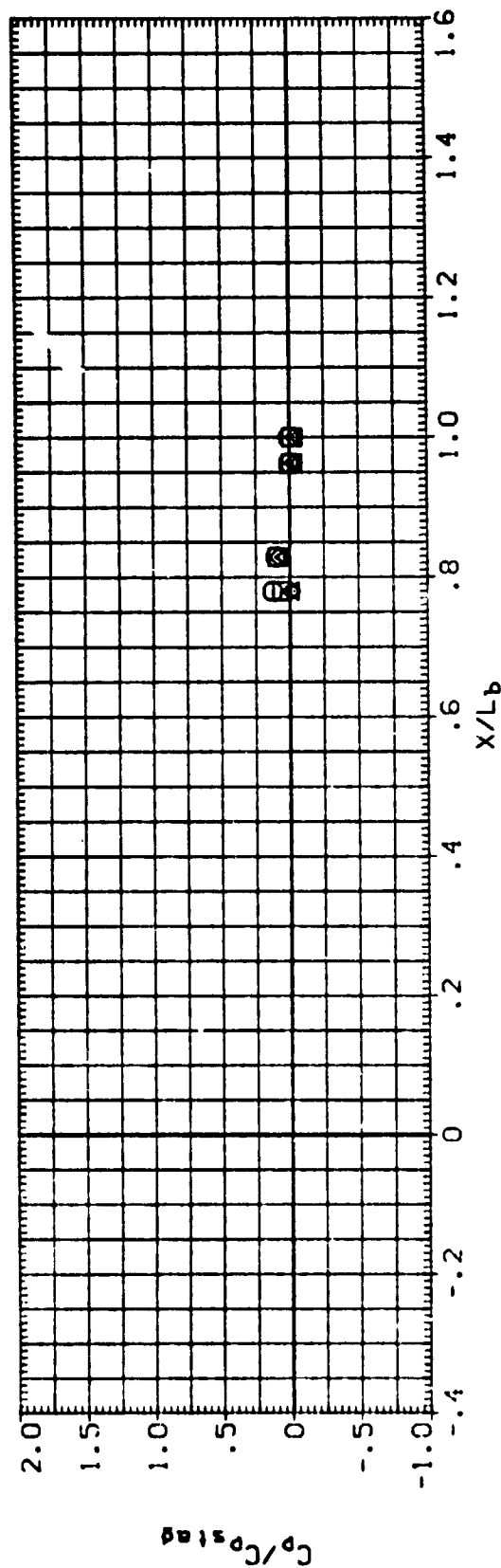


FIG. 44 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. FUSELAGE.
BETA= 0. RN/L= 1.2

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(RQ3BCA) SAVED ALPHA .5.000 PHI 95.000 MICH 3.100
5.000 .000
10.000
20.000

PARAMETRIC VALUES
RN/L 1.200 TA

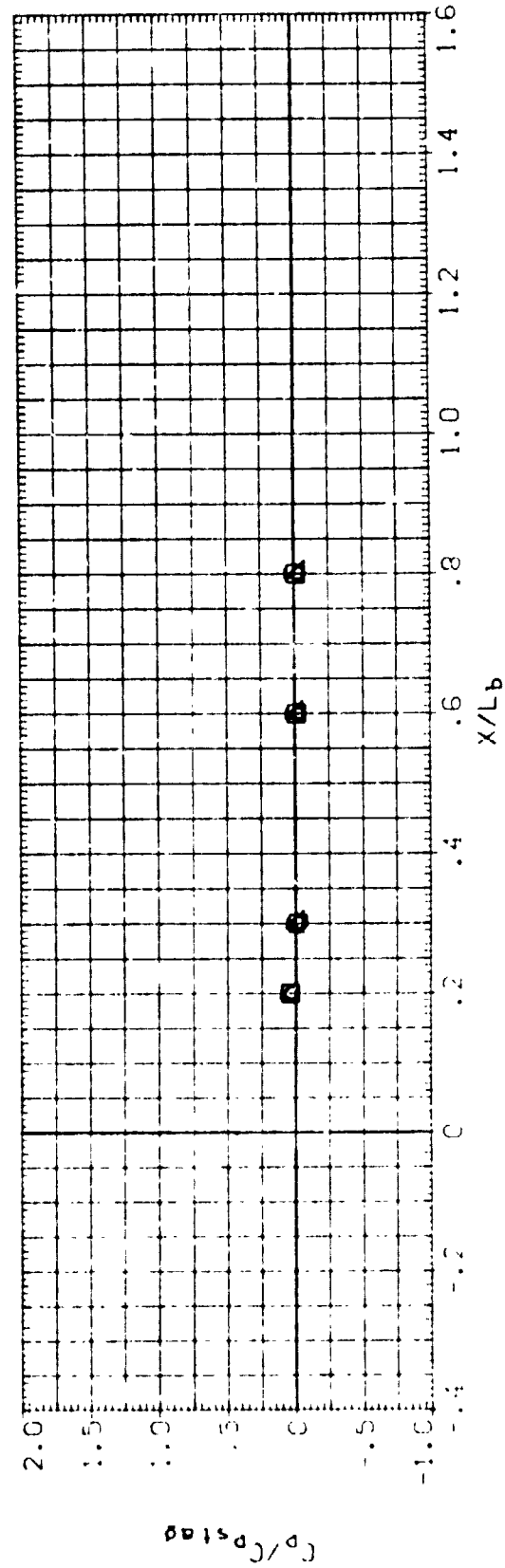
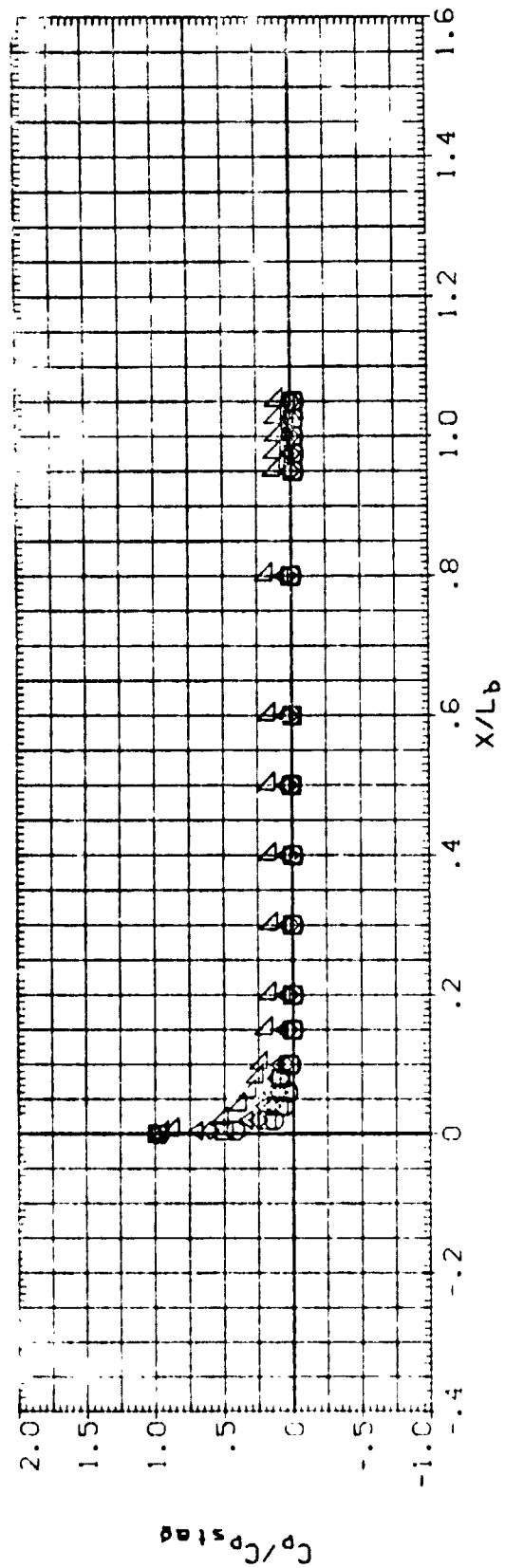


FIG. 44 VARIATION OF CP/CPS ON THE ISOLATED ORBITER, FUSELAGE.
BETA= 0. RN/L= 1.2

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

PARAMETRIC VALUES
RN/L 1.200 BETA .000

ALPHA
-5.000
-1.000
5.000
10.000
20.000

PHI
180.000
121.700

MACH
3.700

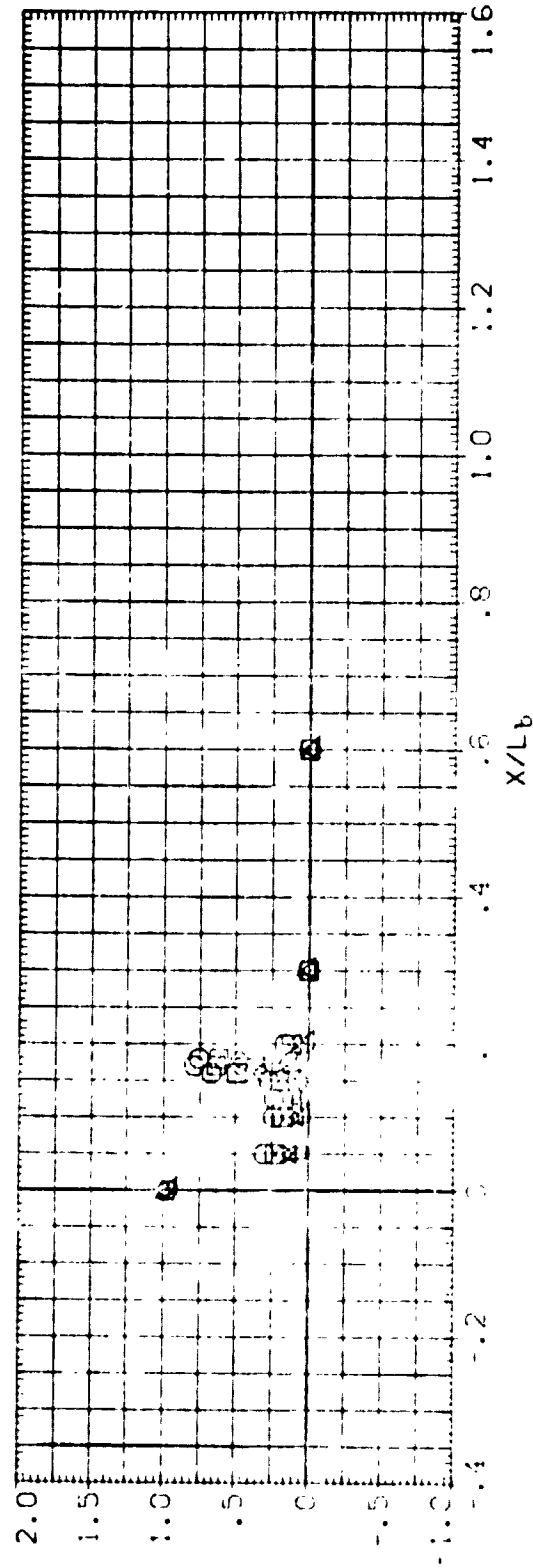
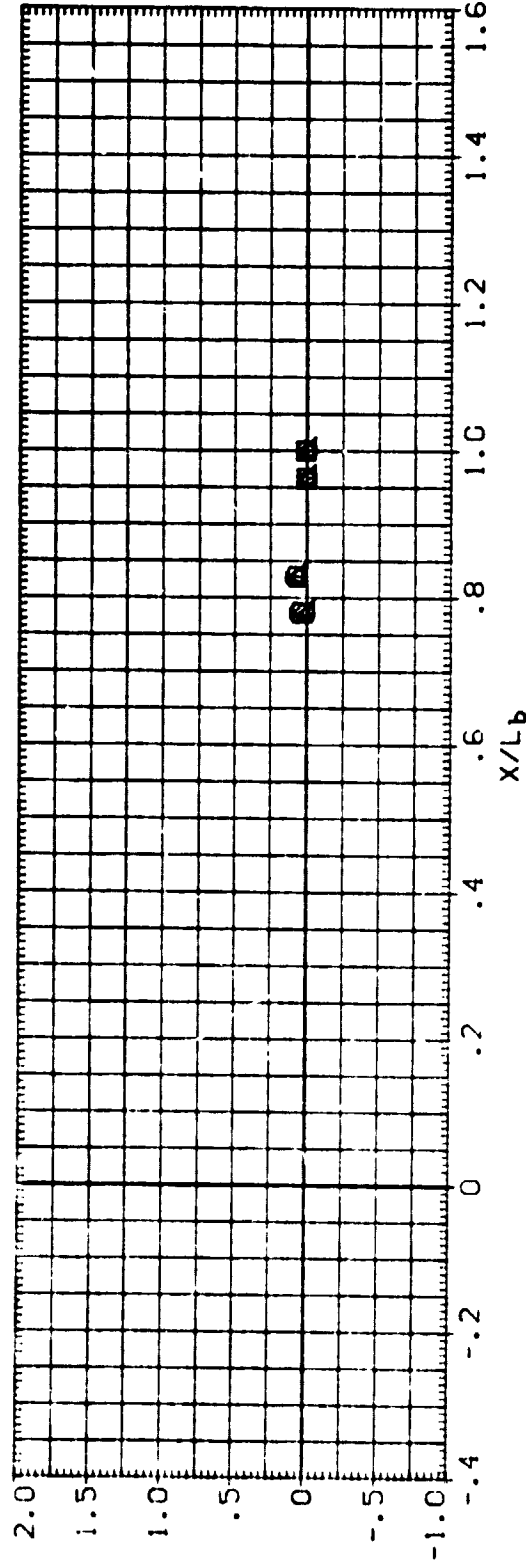


FIG. 44 VARIATION OF C_p/C_{ps100} ON THE ISOLATED ORBITER. FUSELAGE.
BETA= 0. RN/L= 1.2

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(RCSBCA)

PARAMETRIC / ALIAS
1.200 PST.

RN/L

ALPHA PH1 MACH
-5.000 180.000 3.000
-9.000 190.000
5.000
10.000
20.000

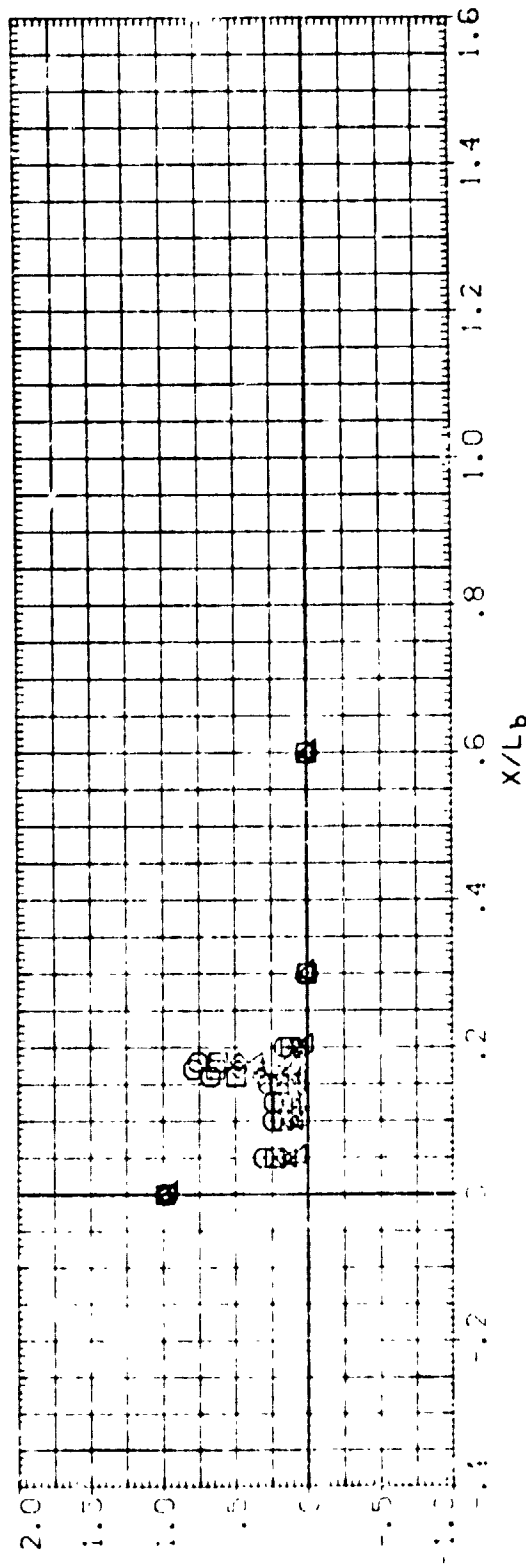
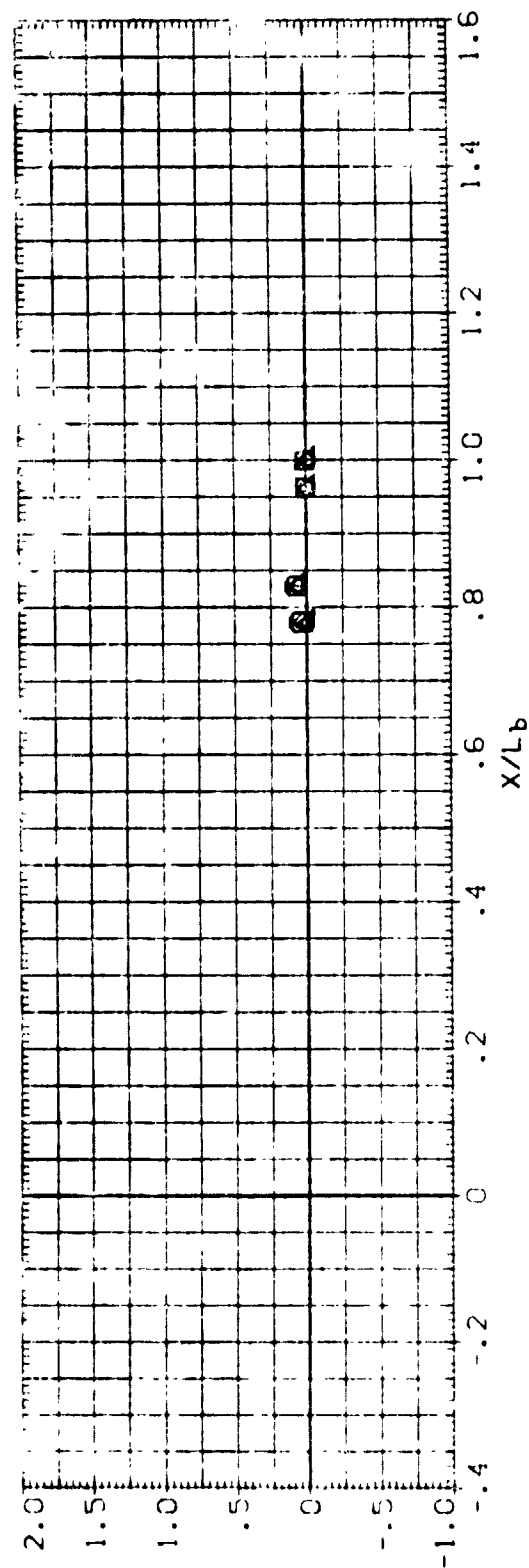


FIG. 44 VARIATION OF CP/CP'S ON THE ISOLATED ORBITER. FUSELAGE.
BETA= 0. RN/L= 1.2

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

SYMBOL ALPHA PHI MACH
 -5.000 180.000 4.800
 .000 122.500
 5.000
 10.000
 20.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

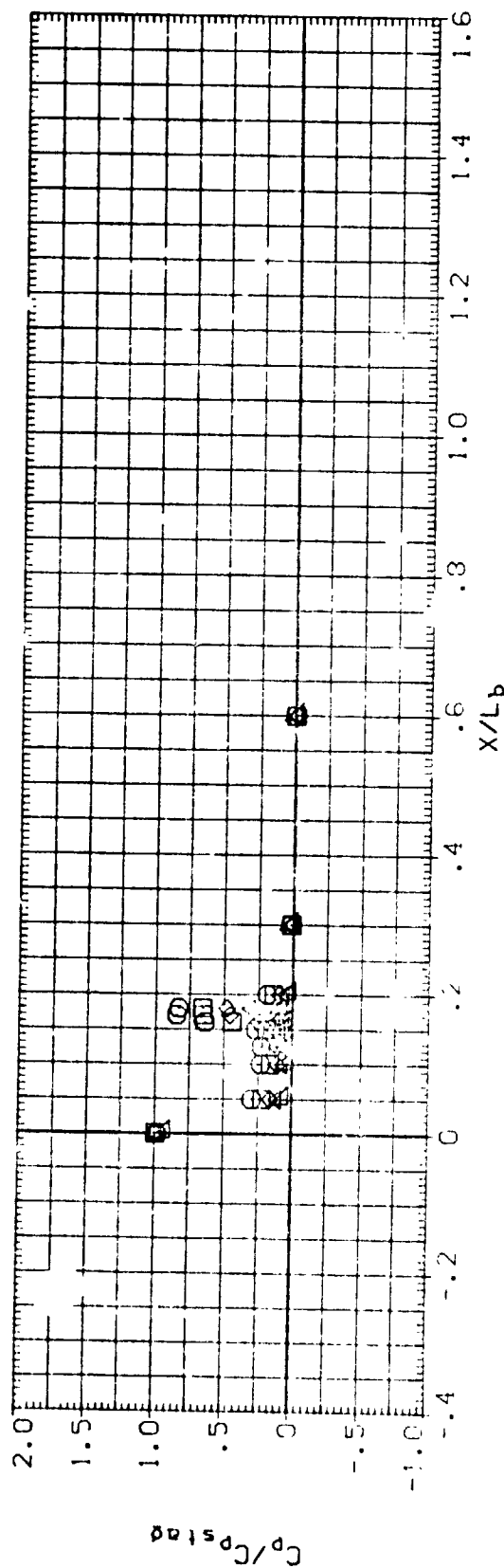
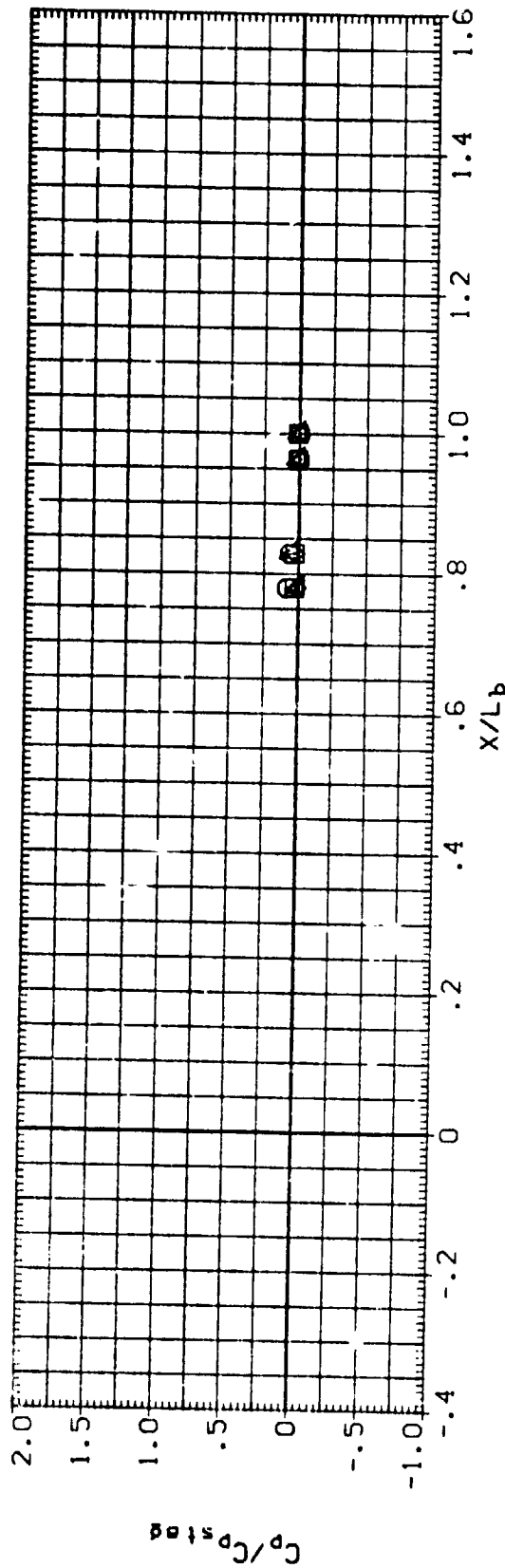


FIG. 41 VARIATION OF C_p/C_{ps} ON THE ISOLATED ORBITER, FUSELAGE.
 BETA= 0, RN/L= 1.2

(R038CA) UPWT 1059 (IH4) 01 ALONE
SYMBOL ALPHA X/LB MACH

ORBITER FUSELAGE

PARAMETRIC VALUE
1.200 BL 0

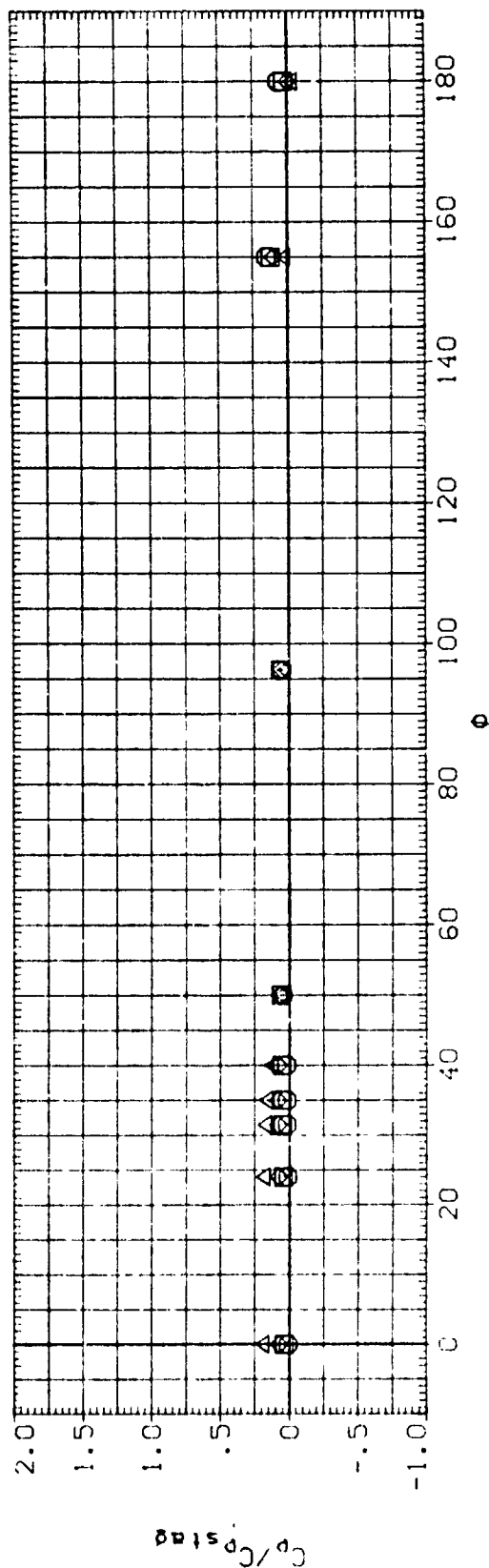
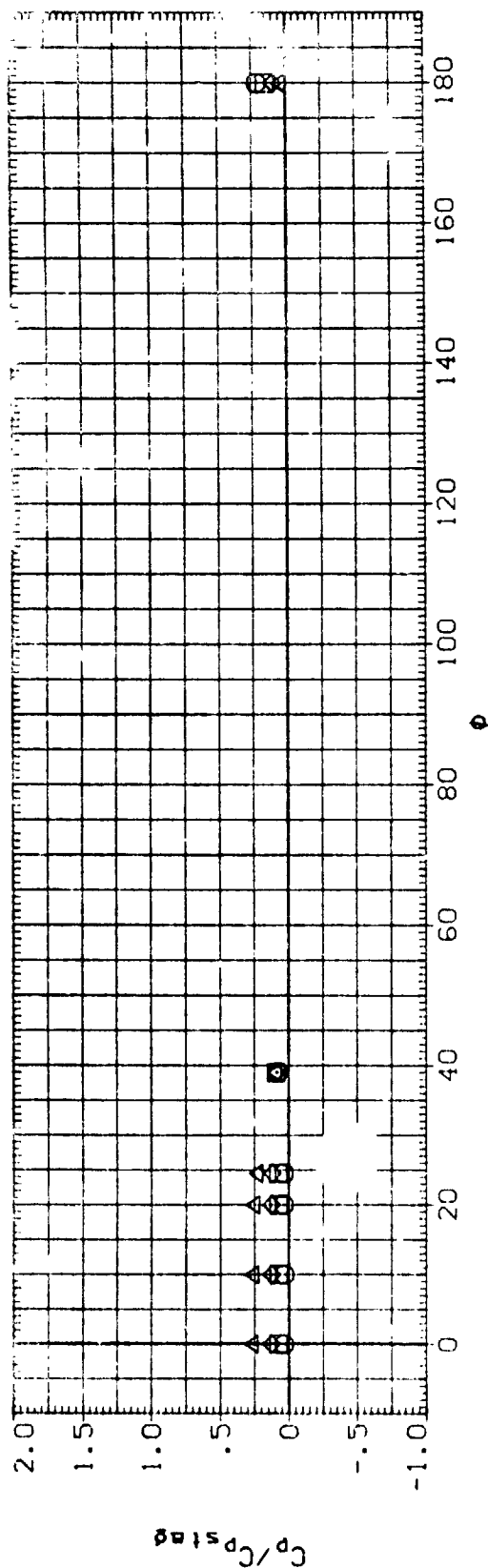


FIG. 44 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. FUSELAGE.
BETA= 0, RN/L= 1.2

REPRODUCIBILITY OF THE
ORIGINAL PAGE IS POOR

(RQ3BCA) UPWT 1059 (IH4) C1 ALONE ORBITER FUSELAGE
 SY-30L ALPHA X/LB MACH 2.360
 .000 .600
 5.000 .300
 10.000
 20.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

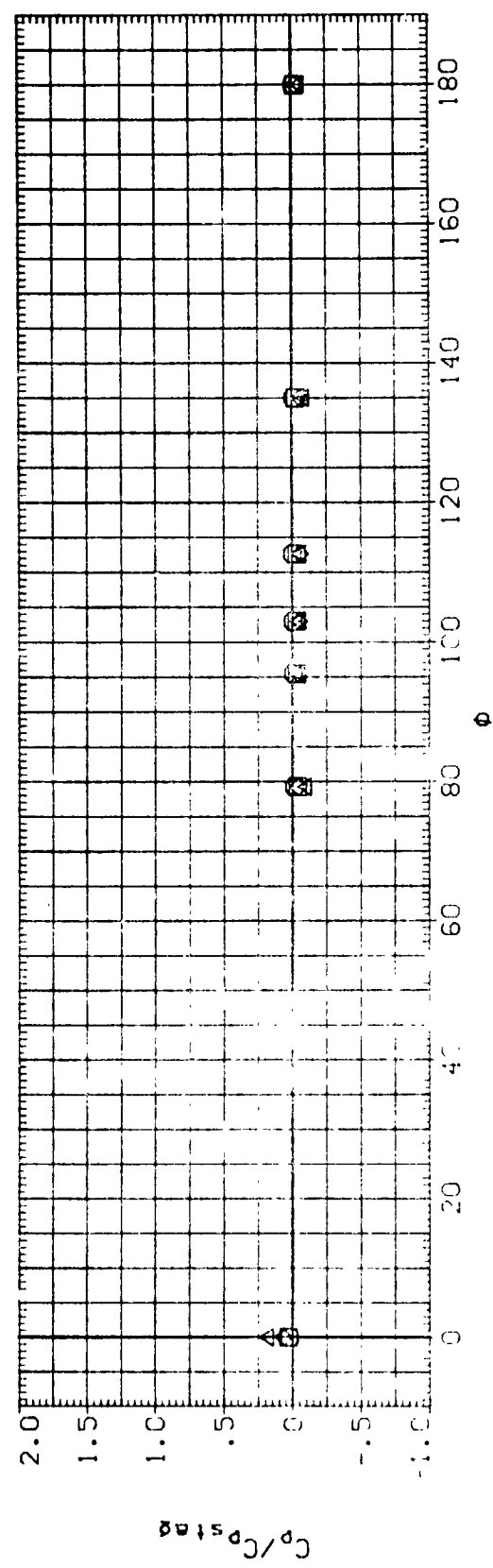
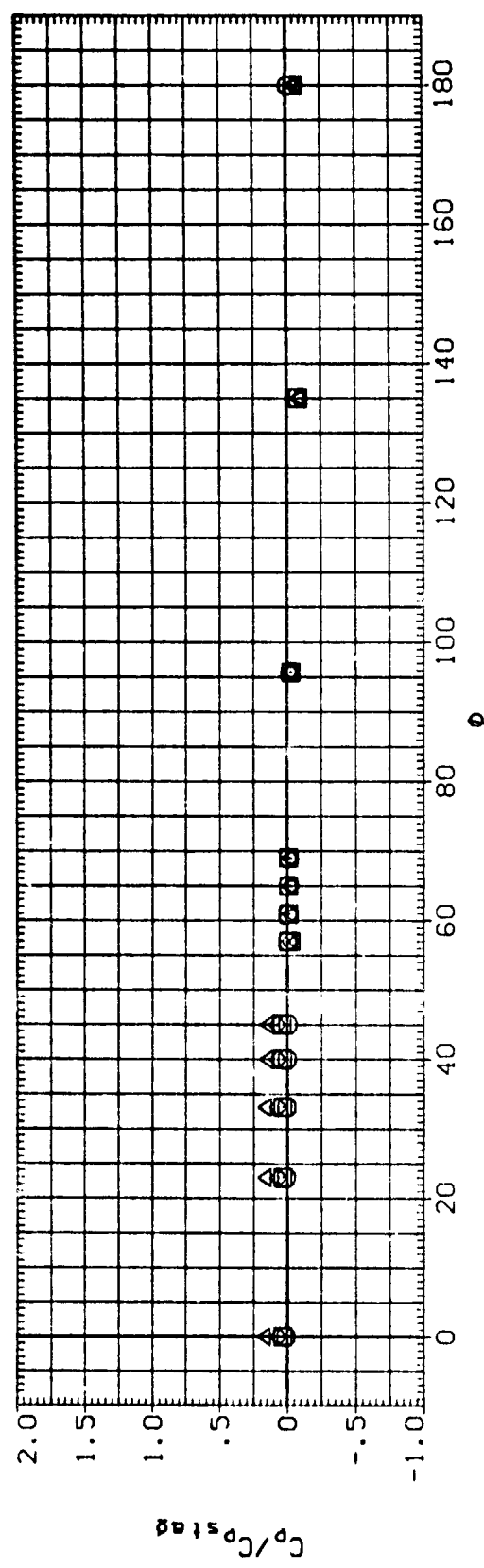


FIG. 44 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. FUSELAGE. BETA= 0, RN/L= 1.2

(R038CA) UPWT 1059 (IH4) 01 ALONE

ORBITER FUSELAGE

PARAMETRIC VALUES

1.250

RA

W/CH 2.550

X/LB .200
.100

ALPHA
.000
5.000
10.000
20.000

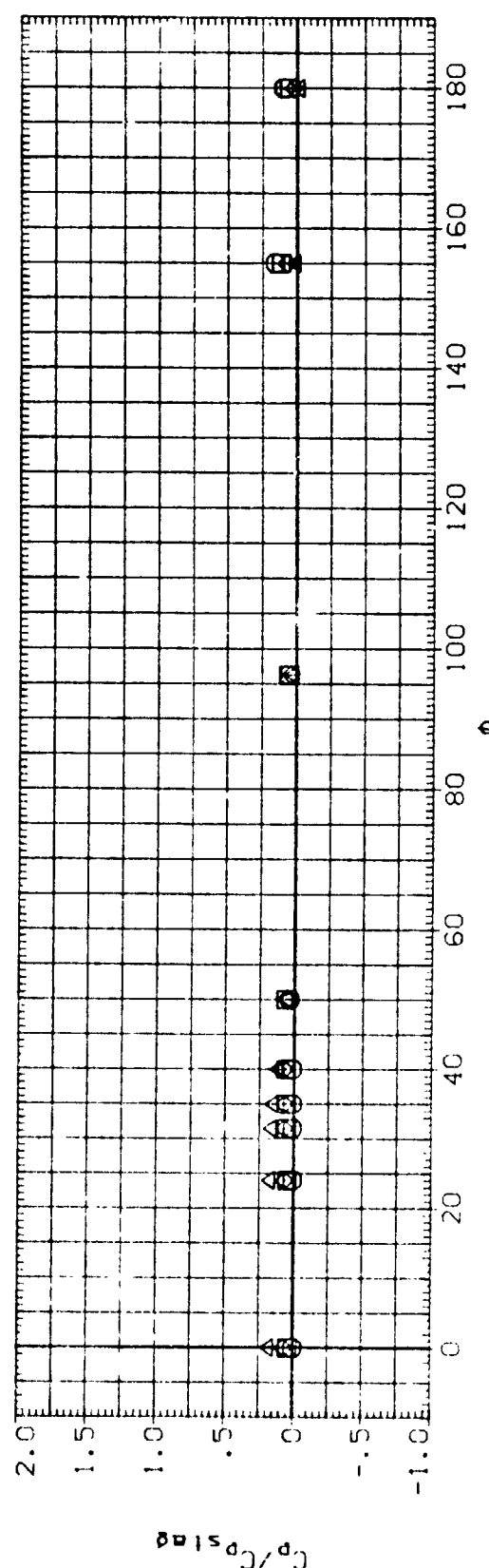
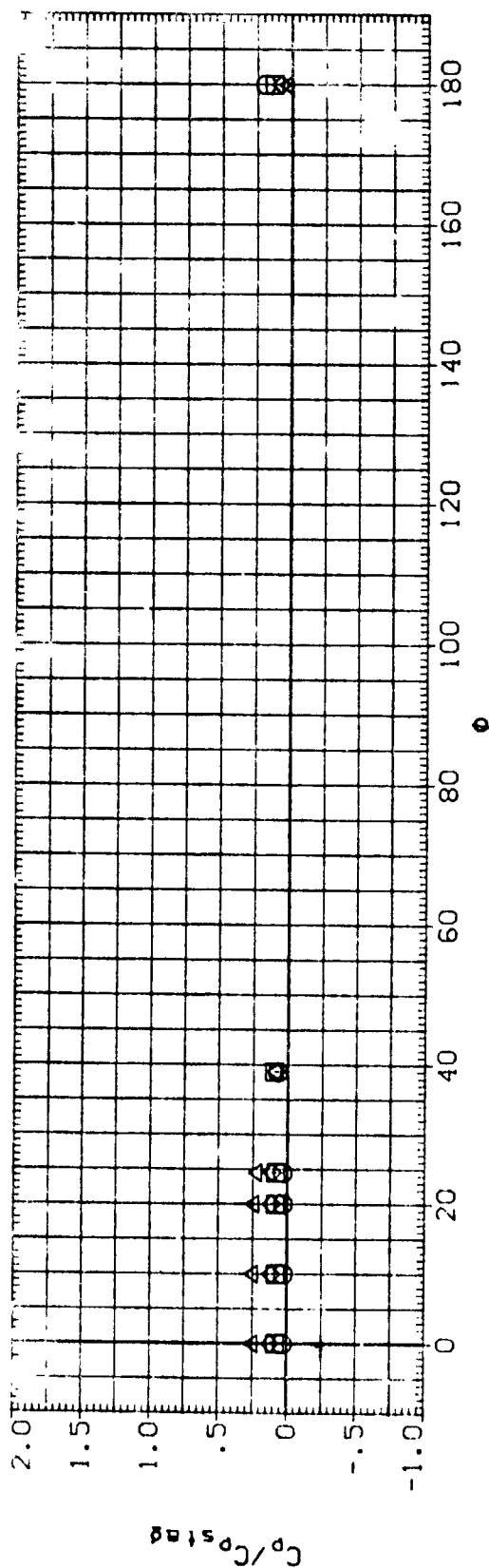


FIG. 44 VARIATION OF CP/CPS ON THE ISOLATED ORBITER FUSELAGE.
BETA = 0, $\epsilon_{M/L} = 1.2$

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(RQ38CA)
 SYMBO: ALP-11
 X/LB .000
 MACH 2.950
 .600
 .300
 5.000
 10.000
 20.000

PARAMETRIC VALUES
 RN/L 1.200
 BETA .000

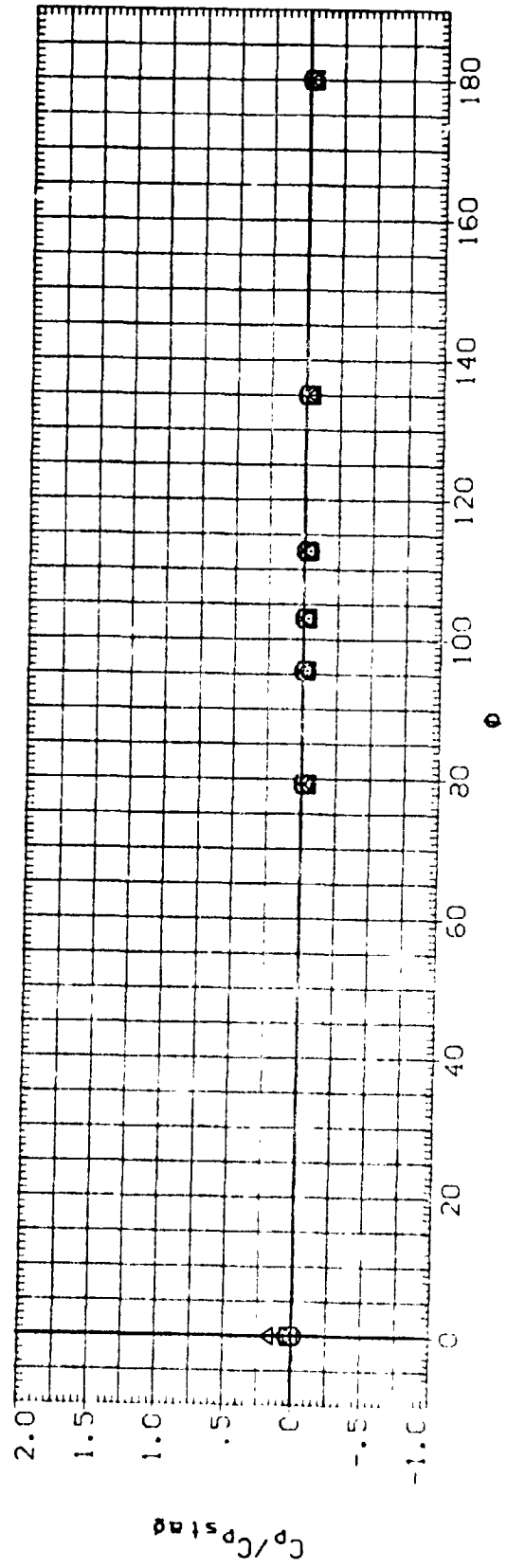
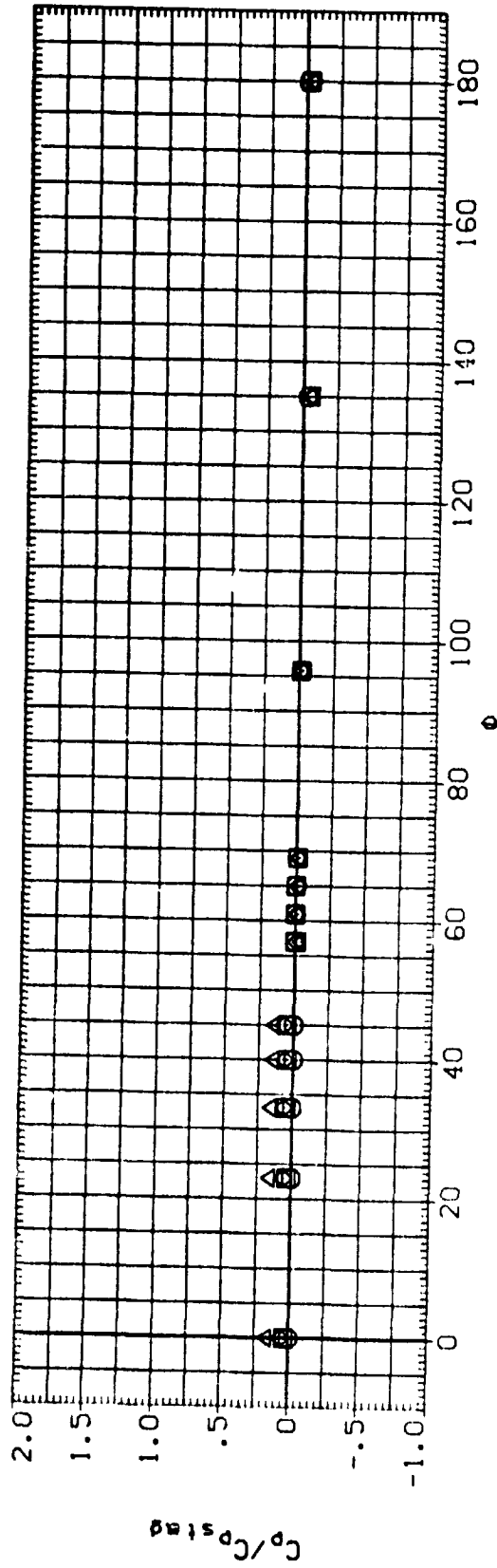


FIG. 44 VARIATION OF C_p/C_{pstag} ON THE ISOLATED ORBITER, FUSELAGE.
 BETA= 0, RN/L= 1.2

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(R038CA) SYMBOL ALPHA X/LB Y/LB Z/LB
 -5.000 0.200 0.100 0.000
 5.000 0.000 0.000 0.000
 10.000 0.000 0.000 0.000
 20.000 0.000 0.000 0.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

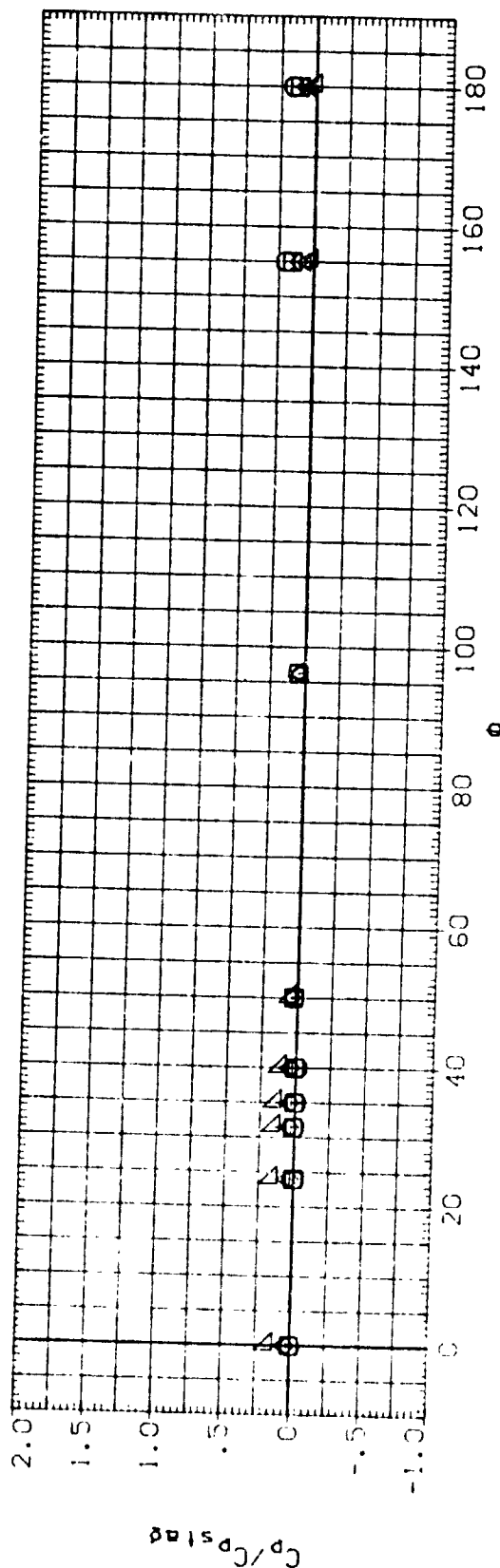
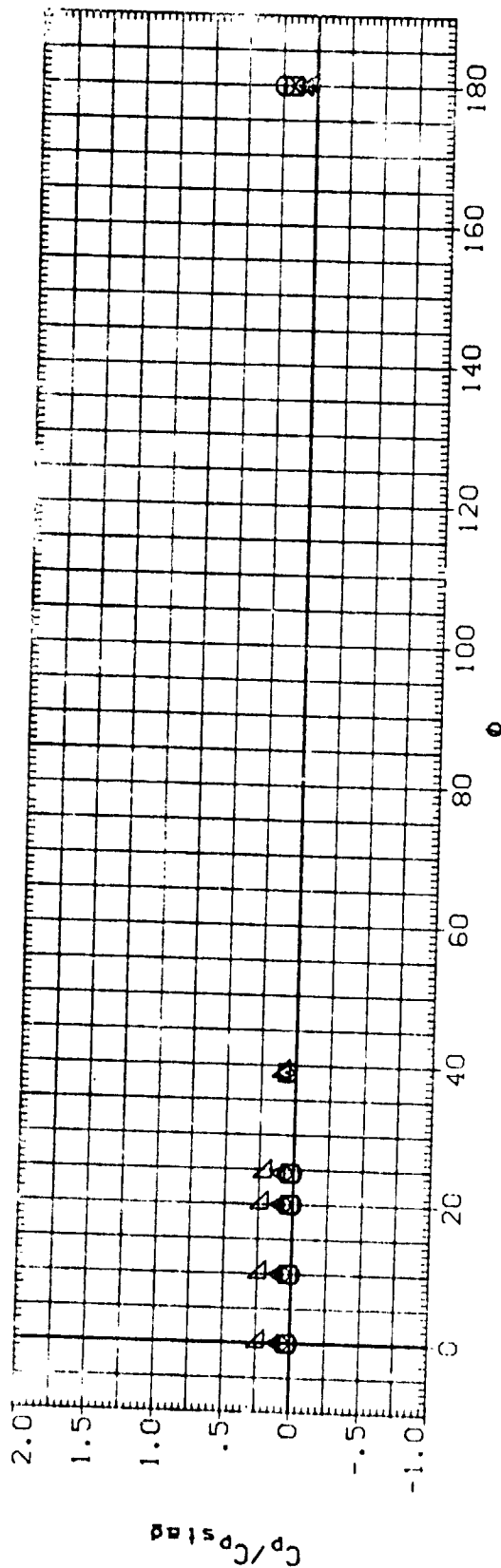


FIG. 44 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. FUSELAGE.
 BETA= 0. RN/L= 1.2



ORBITER FUSELAGE

(R038CA) UPWT 1059 (IH4) 01 ALONE

SYMBOL ALPHA
-5.000
5.000
10.000
20.000

W/LB MACH
.600 3.700
.200

PARAMETRIC VALUES
RN/L 1.200 BETA .000

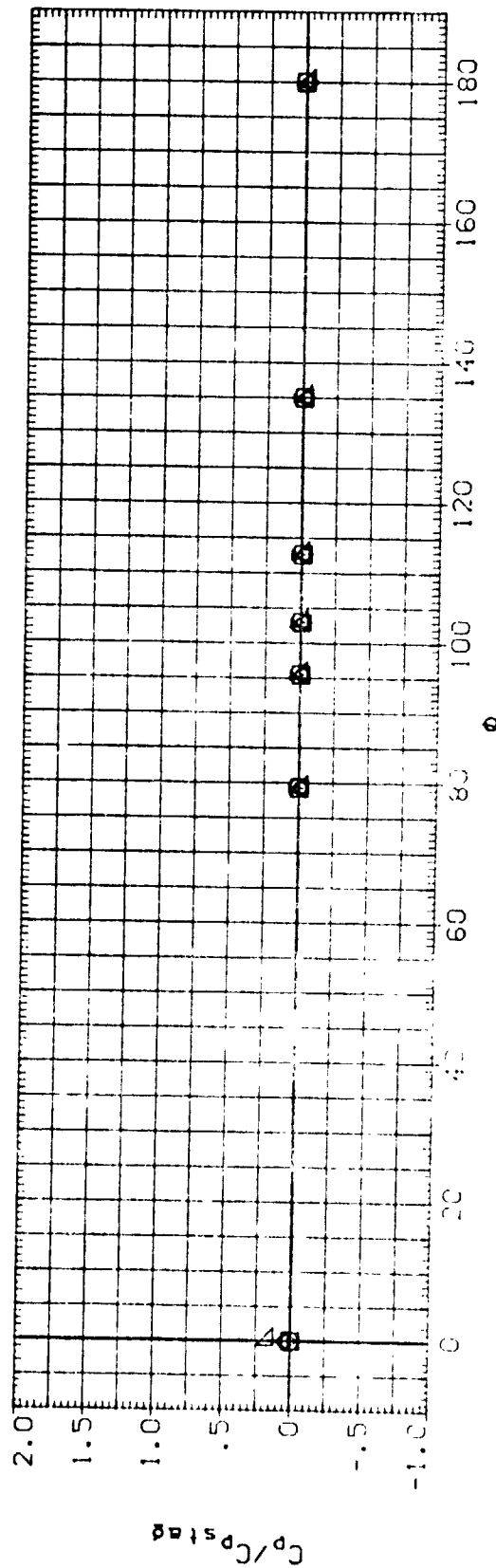
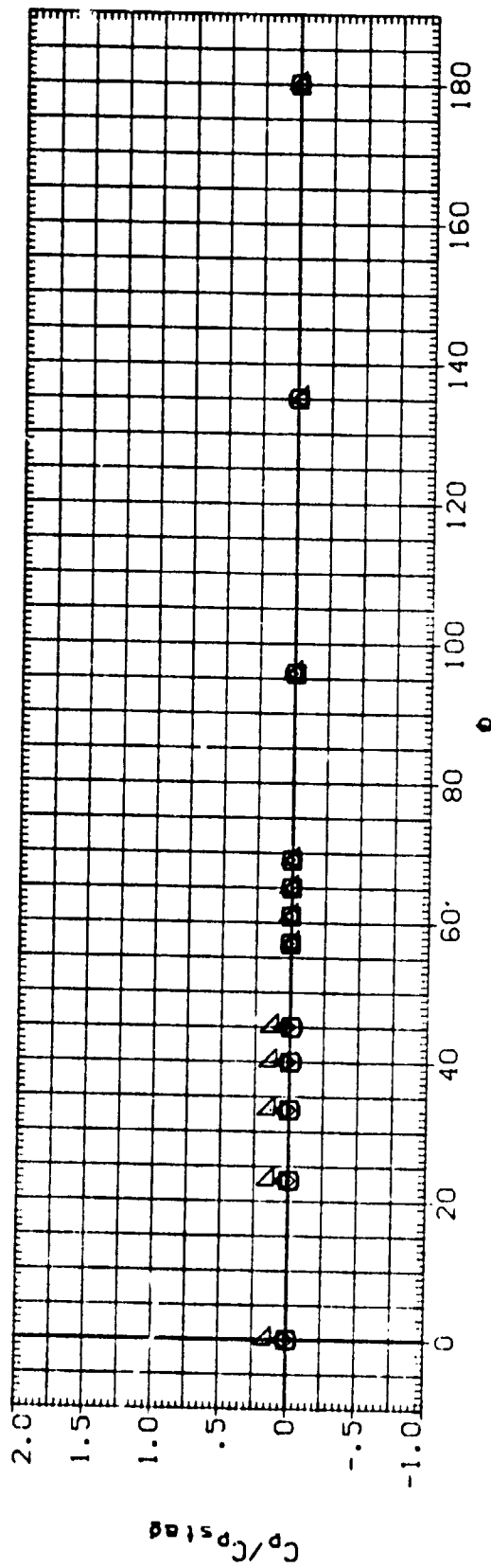


FIG. 44 VARIATION OF C_p/C_{pstag} ON THE ISOLATED ORBITER. FUSELAGE. BETA = 0. RN/L = 1.2

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

(R038CA)

PARAMETRIC VALUES
RN/L 1.200 BETA 0.00

ALPHA X/LB MACH
-5.000 .200 4.500
5.000 .100
10.000
20.000

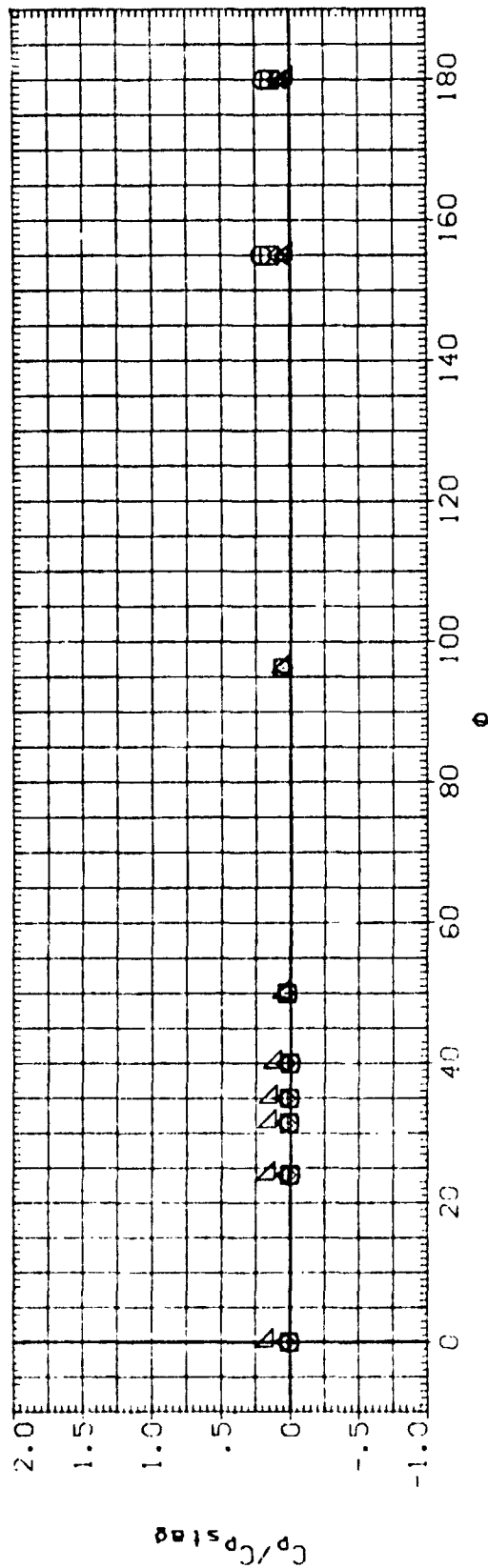
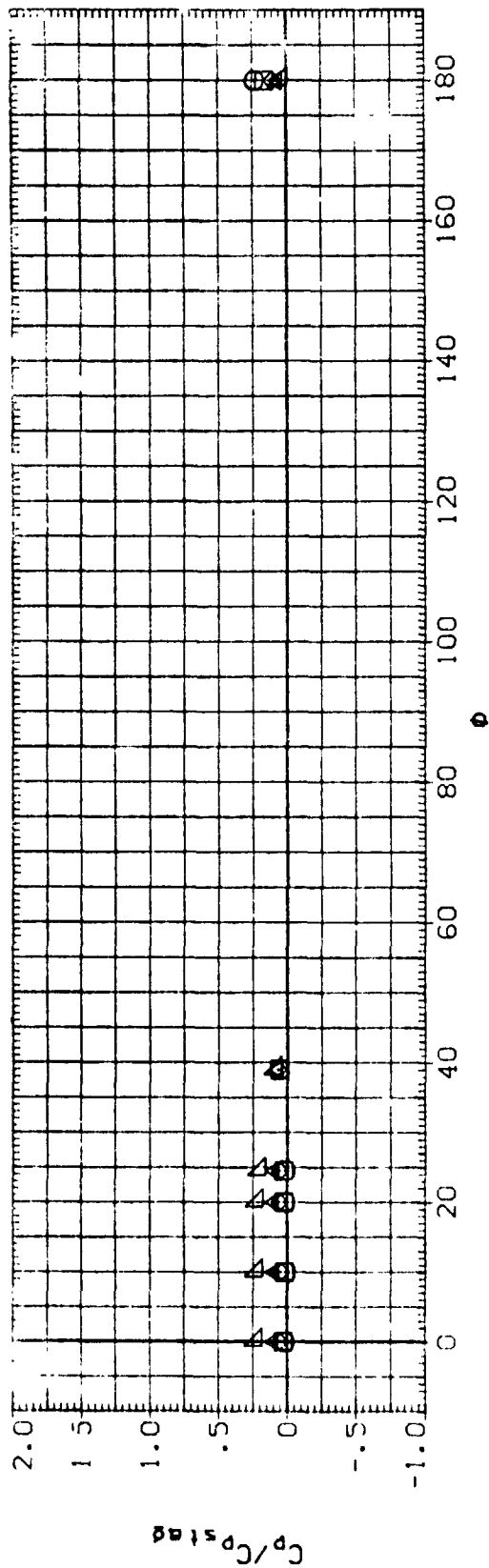


FIG. 44 VARIATION OF C_p/C_{ps} ON THE ISOLATED ORBITER. FUSELAGE.
BETA= 0. RN/L= 1.2

ORBITER FUSELAGE

UPWT 1059 (IH4) 01 ALONE

ALPHA
-5.000
-60.0
5.000
10.000
20.000

Y/LB
.600
.300

MACH
4.600

PARAMETRIC VALUES
RN/L 1.200 BETA .000

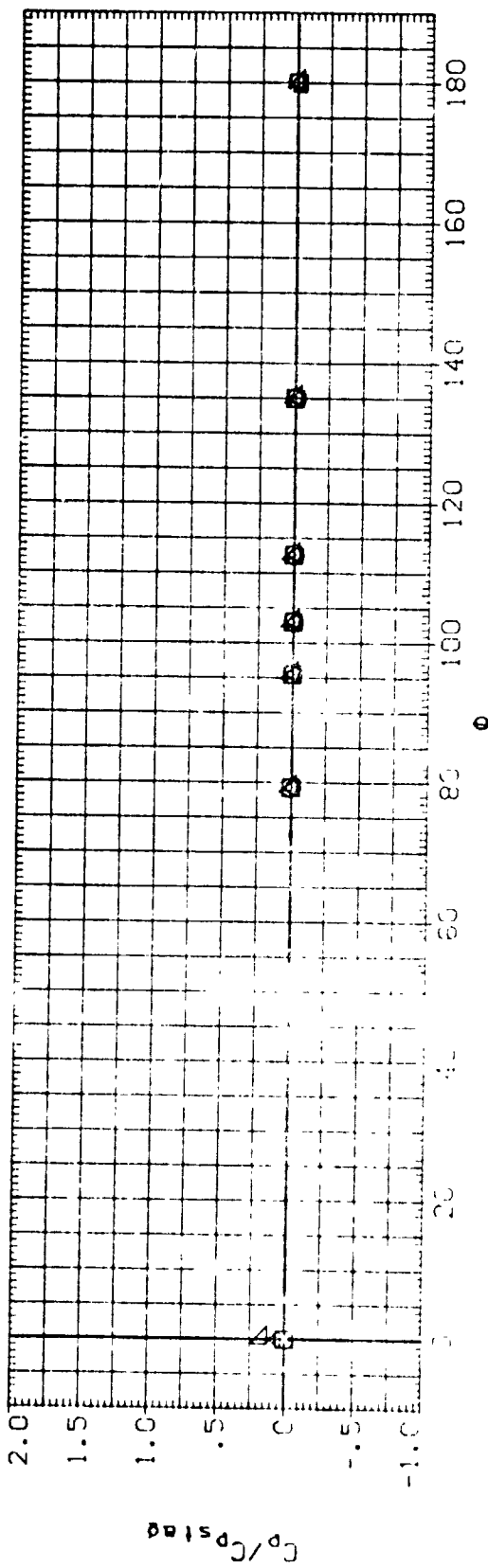
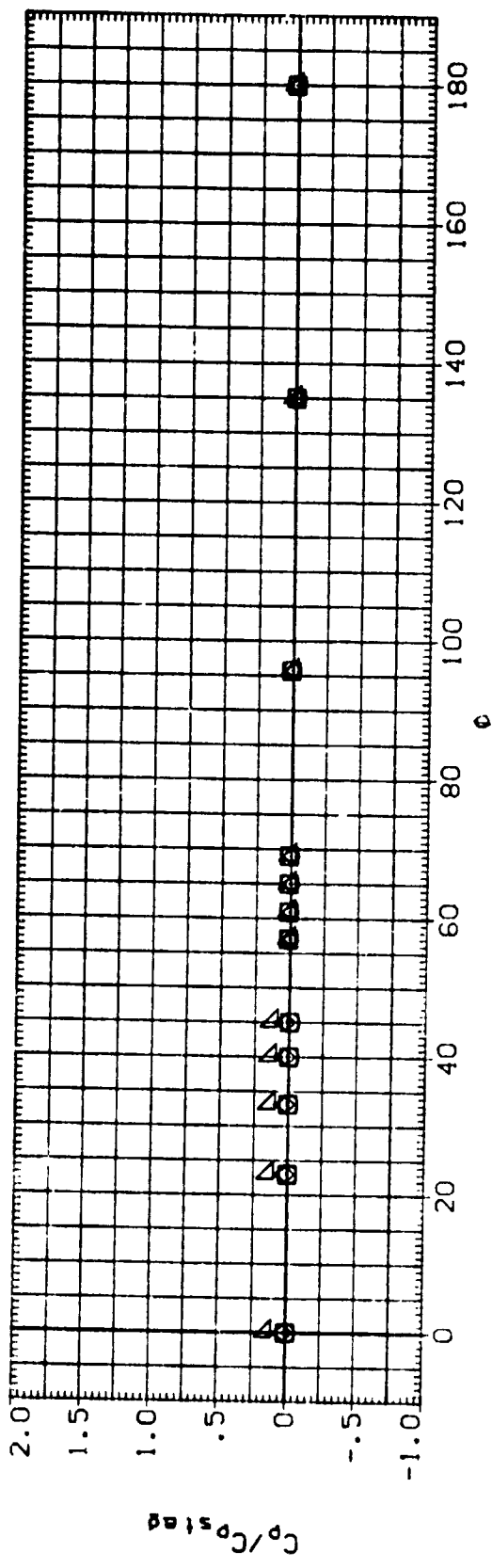


FIG. 44 VARIATION OF C_p/C_{pslag} ON THE ISOLATED ORBITER. FUSELAGE.
BETA = 0. RN/L = 1.2

(RQ3LCA) UPWT 1059 (IH4) 01 ALONE ORB. LOWER WING
 SYMBOL ALPHA 2Y/BV MACH
 .000 .400 2.760
 5.000 .250
 10.000
 20.000

PARAMETRIC VALUES
 RN/L 1.200 BETA .000

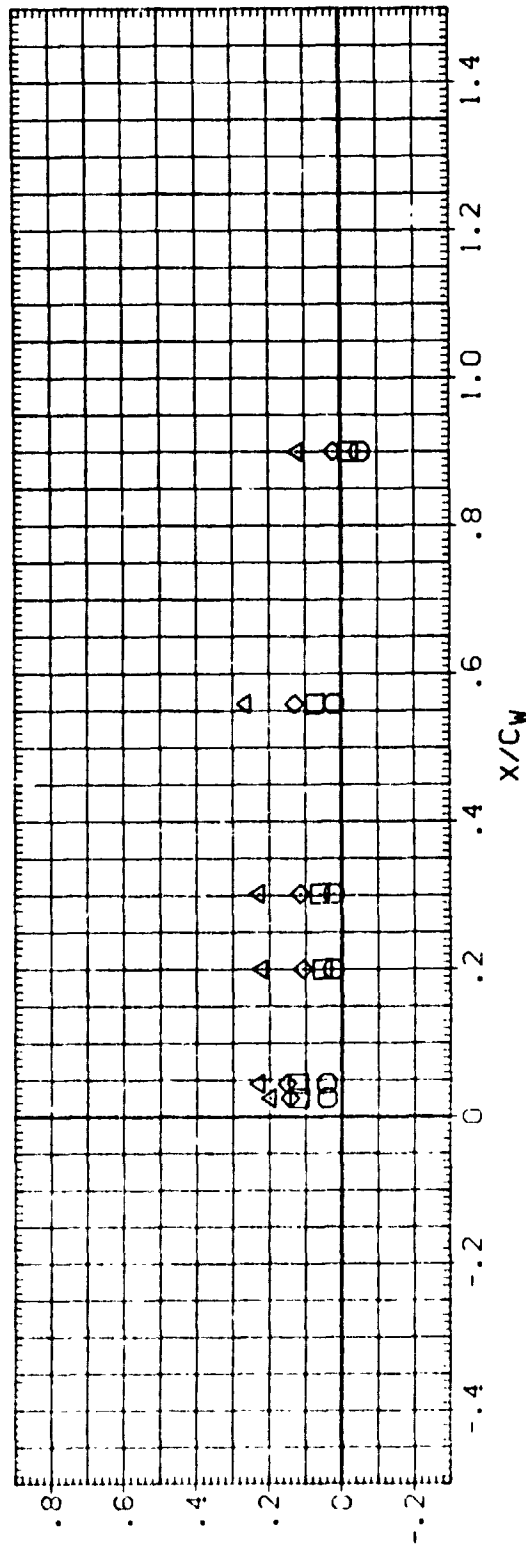
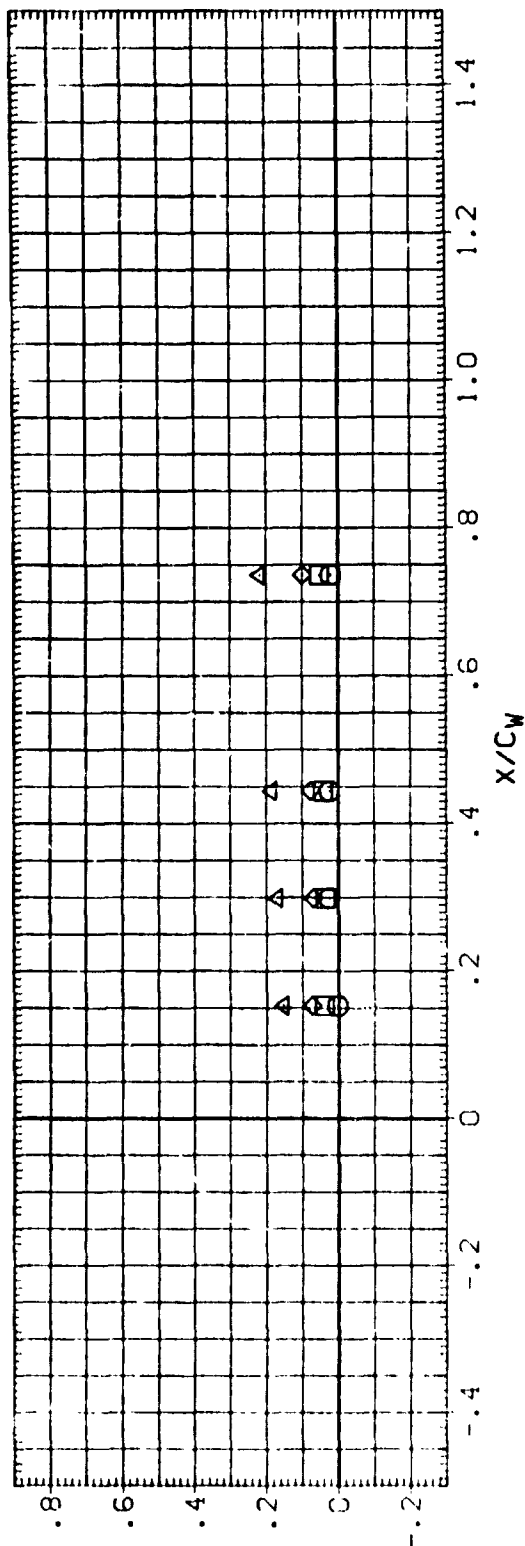


FIG. 45 VARIATION OF CP/CPS ON THE ISOLATED ORBITER, LOWER WING.
 BETA= 0. RN/L= 1.2

(R03LCA) UPWT 1059 (IH4) 01 ALONE ORB. LOWER WING

SYMBOL ALPHA 21/5. MACH 2.360

0.000 .600 .500

5.000 10.000 20.000

PARAMETRIC VALUES

RN/L 1.200 BETA .000

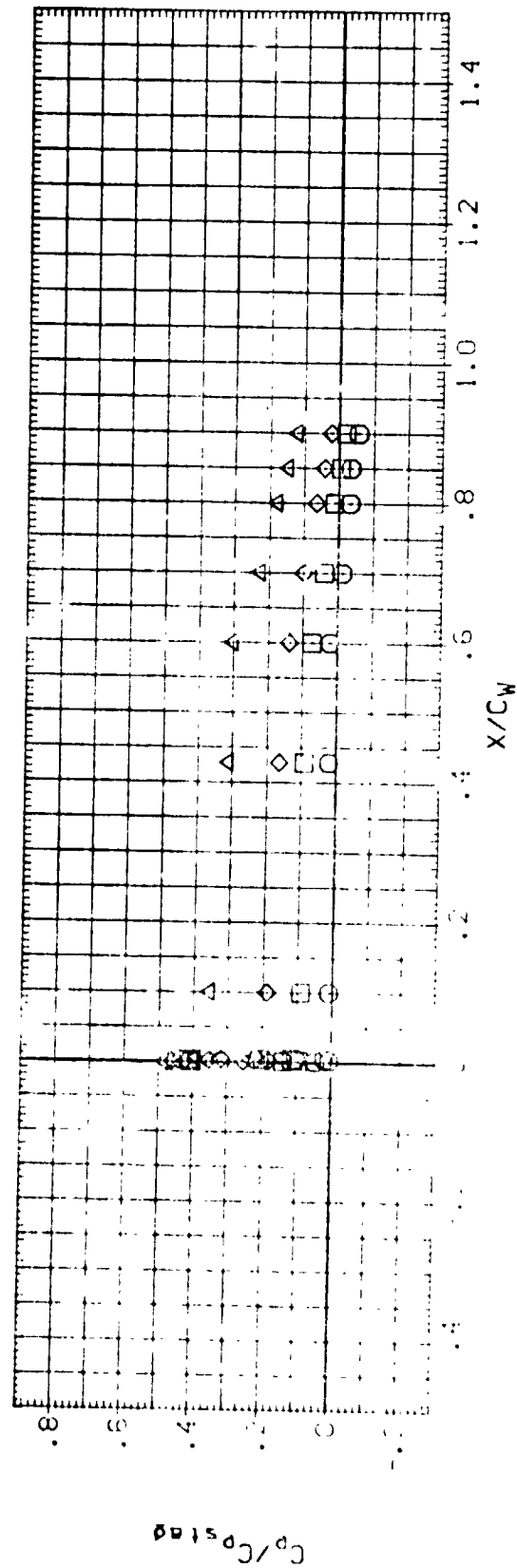
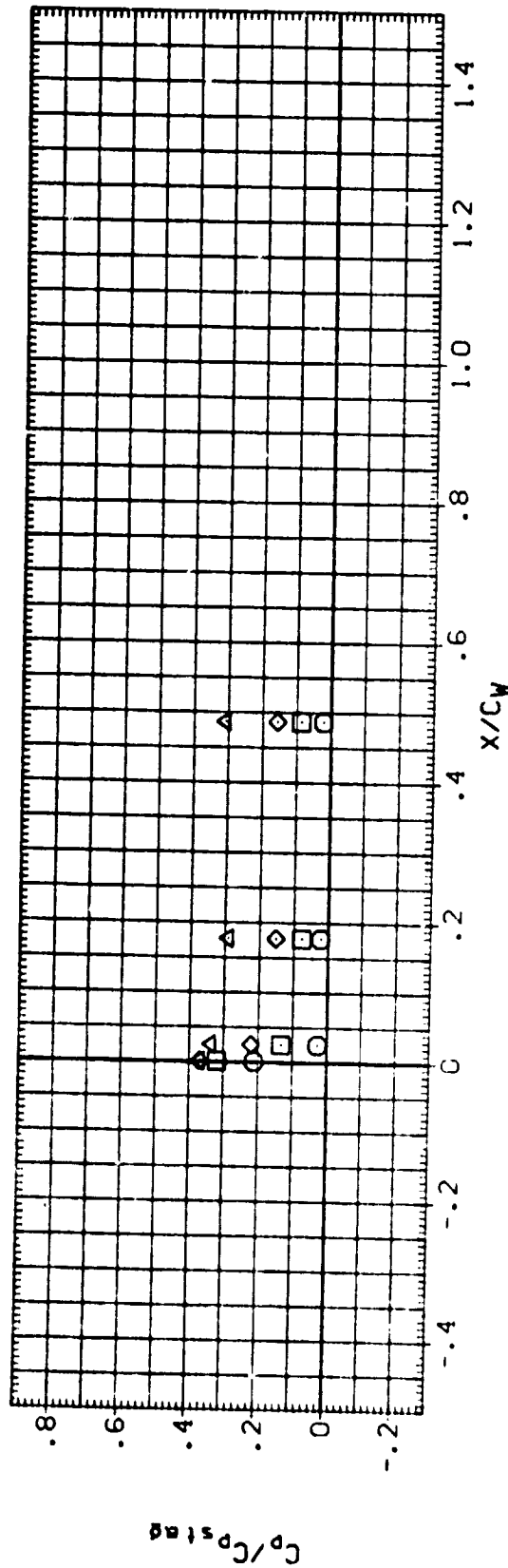


FIG. 45 VARIATION OF CP CPS ON THE ISOLATED ORBITER. LOWER WING.
BETA=0. RN/L=1.2

UPWT 1059 (IH4) 01 ALONE ORB. LOWER WING

PAE ETIC VALUES
1.200 BETA .000

RN/L

HA 2Y/BW M-CH
5.850 2.760
10.200
20.000

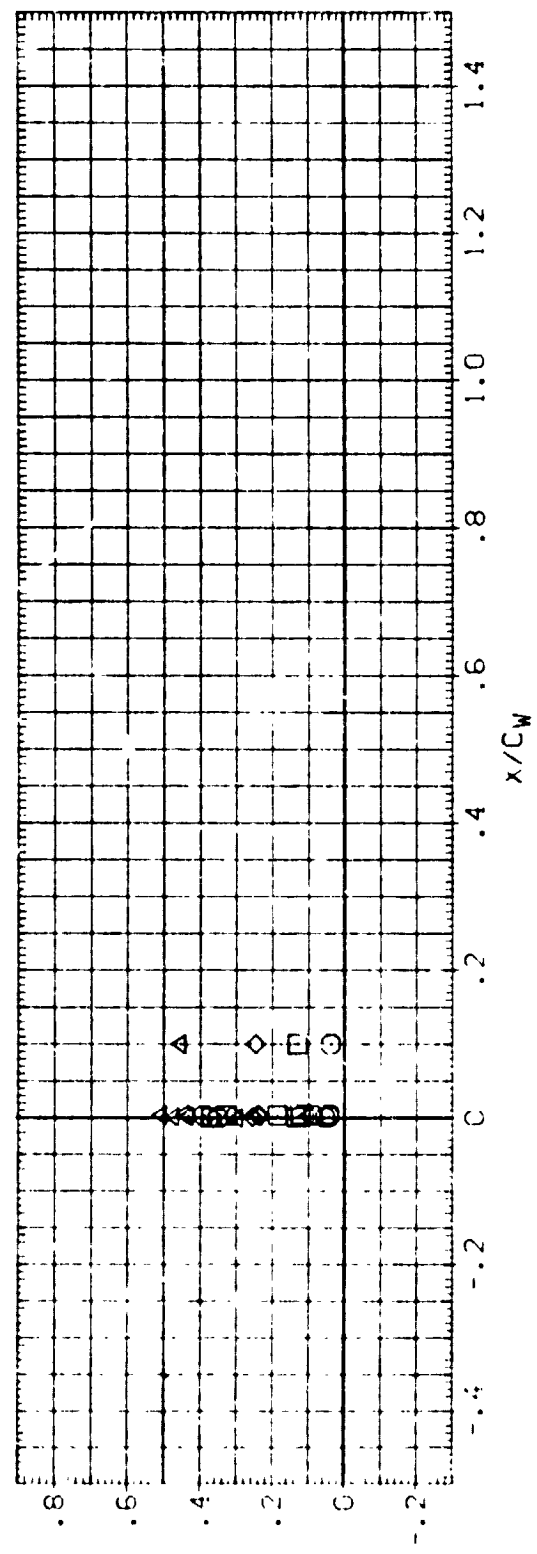
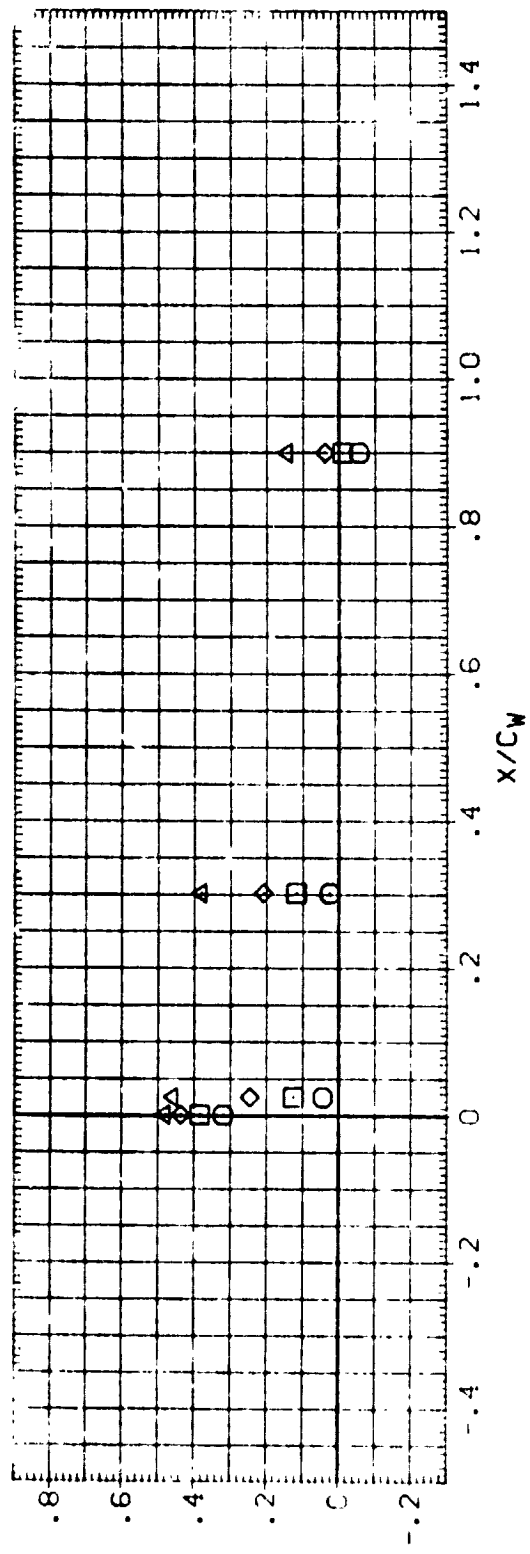


FIG. 45 VARIATION OF CP/CPS ON THE ISOLATED ORBITER, LOWER WING.
BETA= 0. RN/L= 1.2

ORB. LOWER WING

UPWT 1059 (IH4) 01 ALONE

PARAMETRIC VALUES
RN/L 1.200 BETA .000

SYMBOL ALPHA 2V/BV MACH
□ .000
○ .400
△ .250
◇ .250

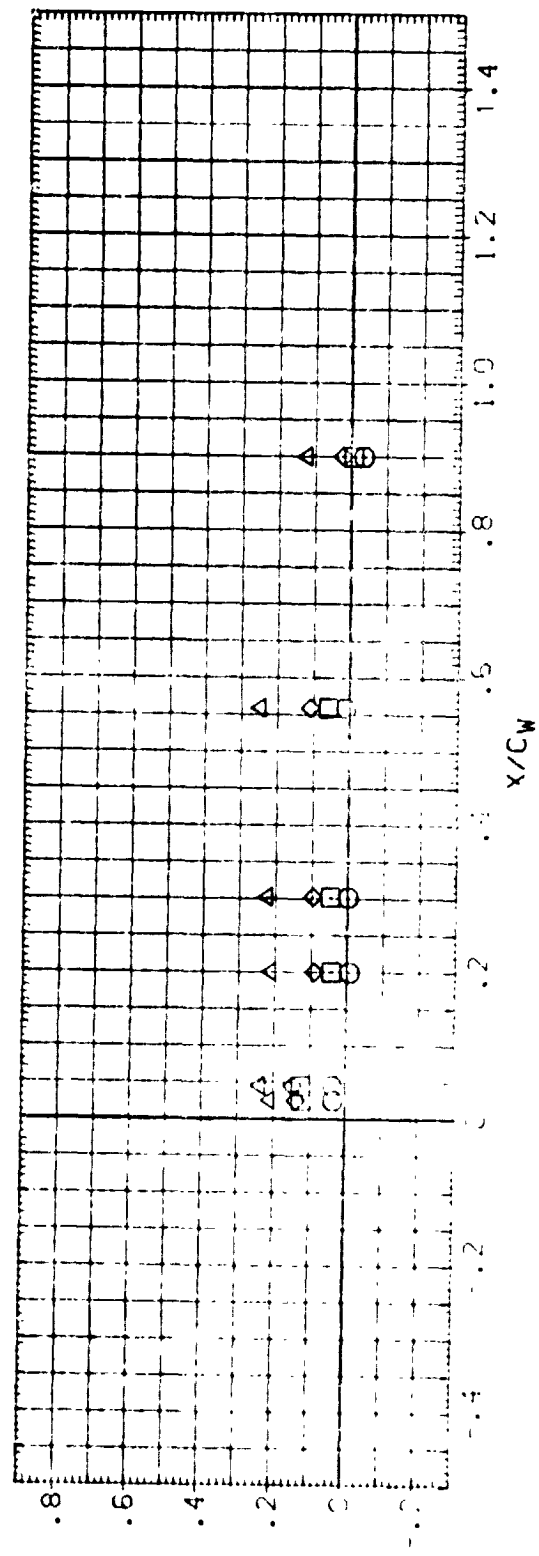
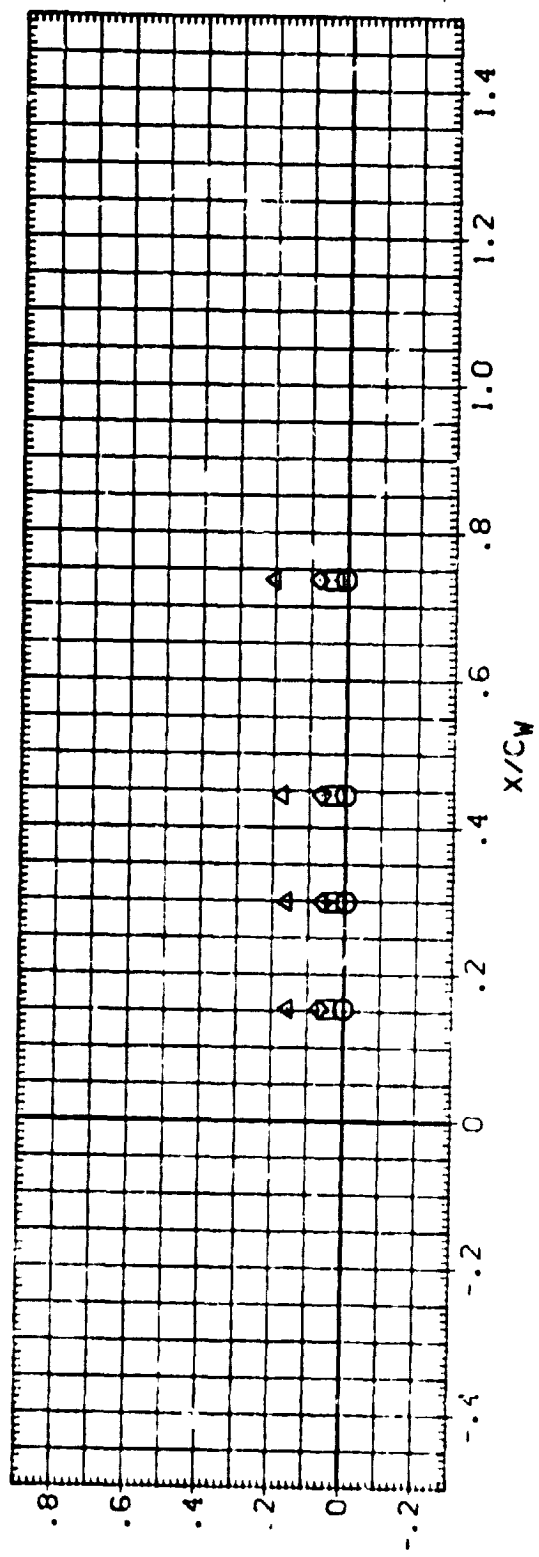


FIG. 45 VARIATION OF CP/CPs ON THE ISOLATED ORBITER, LOWER WING.
BETA= 0. RN/L= 1.2

ORB. LOWER WING

UPWT 1059 (IH4) 01 ALONE

SVRCS ALPHA 20.000
 5.000
 10.000
 20.000

RN/L 1.2.0 BETA 1.2

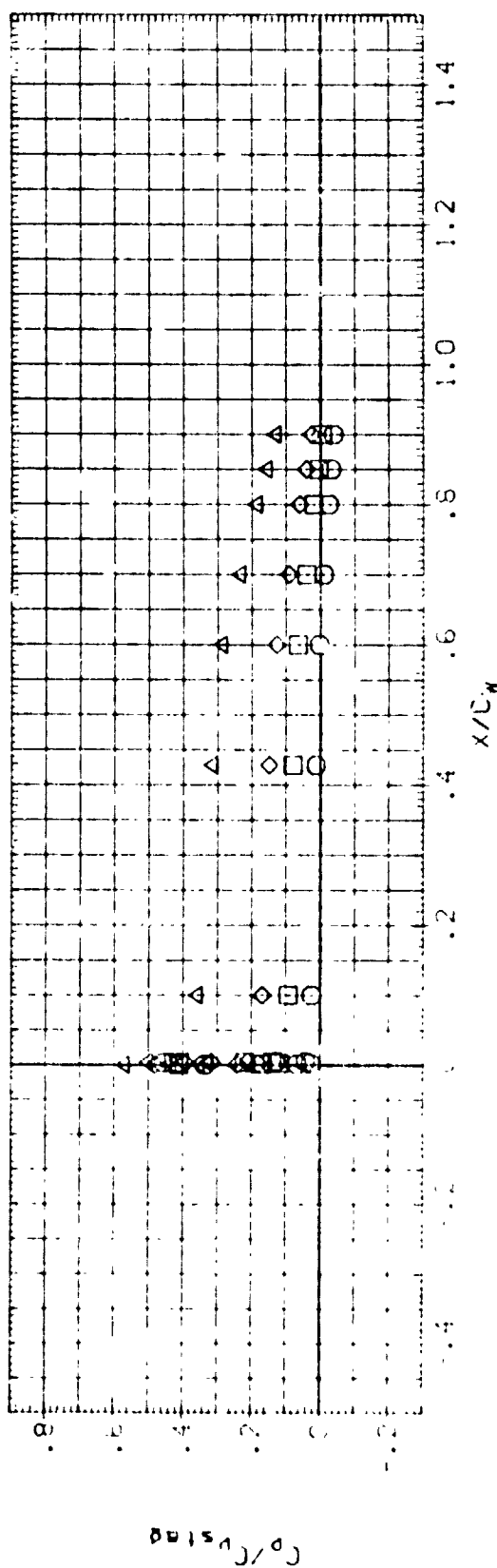
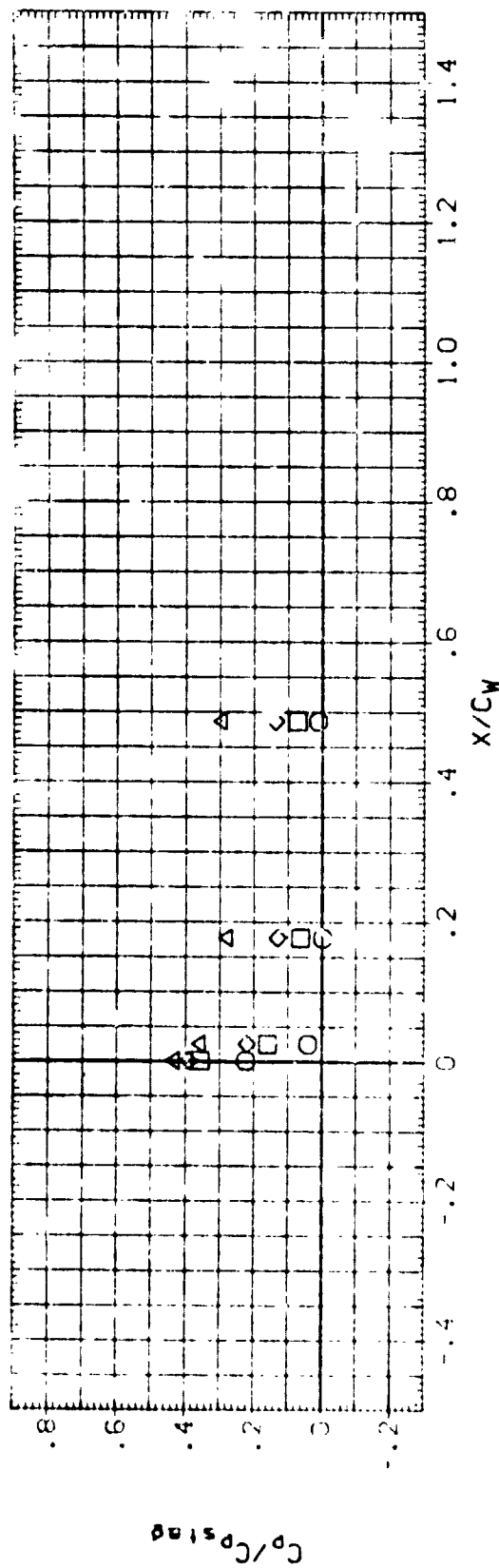


FIG. 45 VARIATION OF $C_D/C_{D_{sing}}$ ON THE ISOLATED ORBITER, LOWER WING.
 BETA = 0. RN/L = 1.2

ORB. LOWER WING

UPWT 1059 (IH4) 01 ALONE

PARAMETRIC VALUES
1.200 BETA .000

R_h/L

ALPHA
SYNCH
0.000
5.000
10.000
20.000

ZY/B_a
.850
.750

MACH
2.950

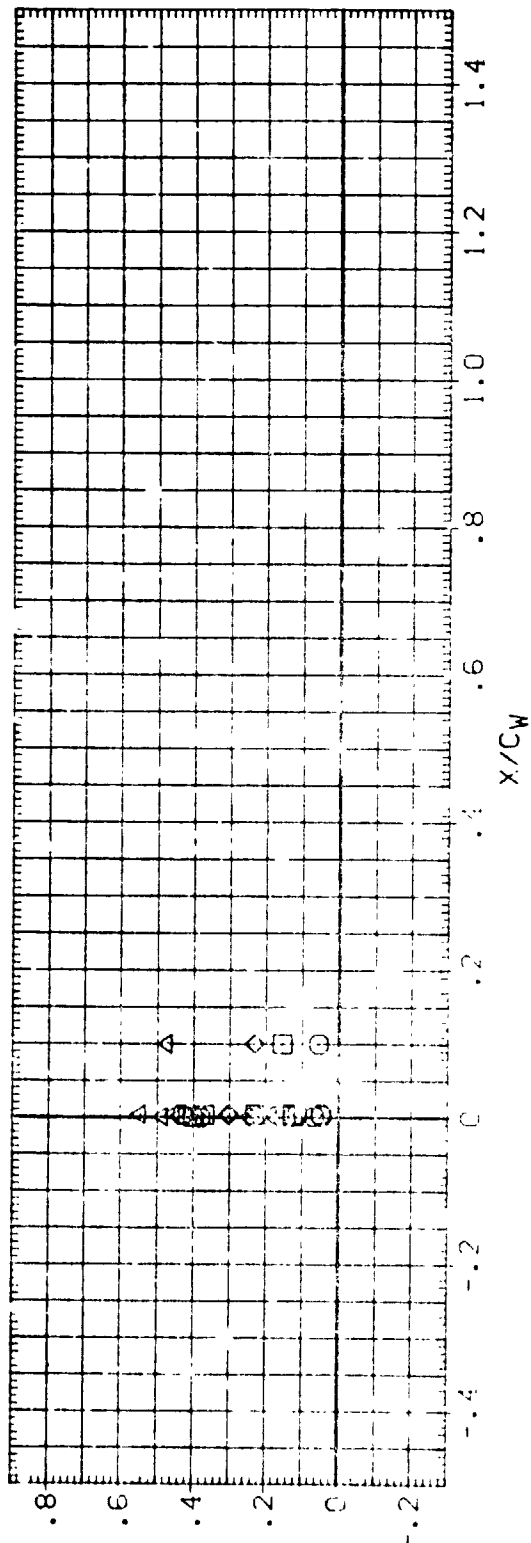
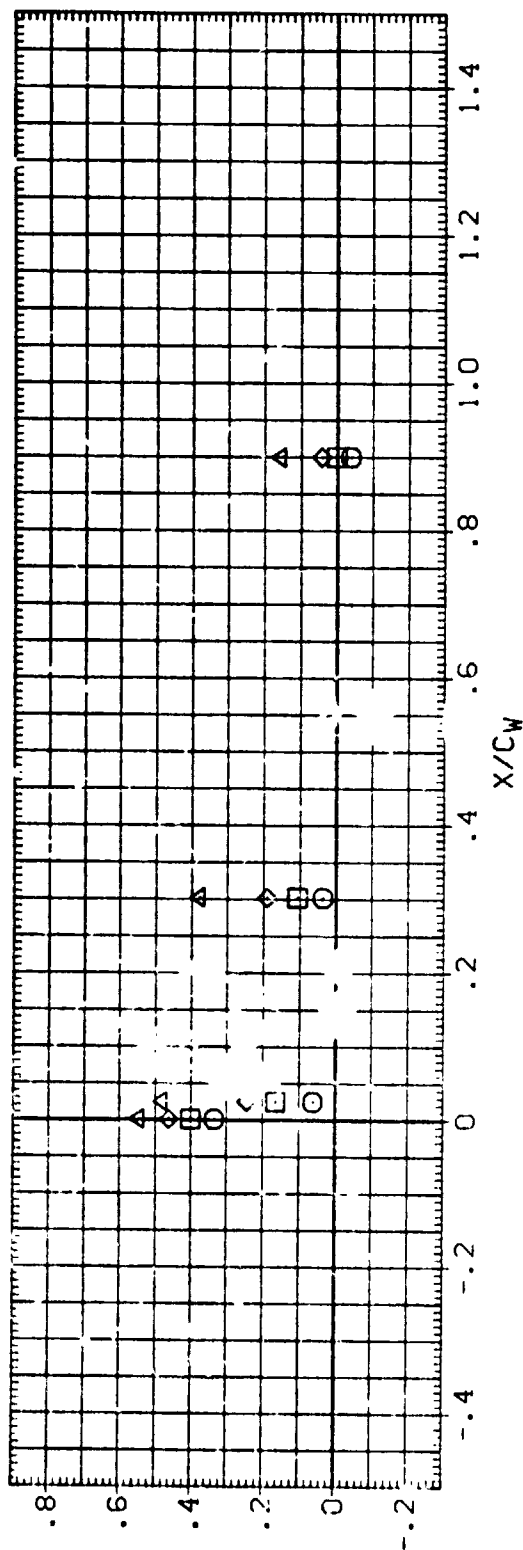


FIG. 45 VARIATION OF $C_p/C_{p_{stag}}$ ON THE ISOLATED ORBITER, LOWER WING.
BETA = 0, $R_n L = 1.2$

ORB. LOWER WING

UPWT 1059 (144) 01 ALONE

(203LCA)

PARAMETER VALUE
1.200 BETA

2Y/BW
400
250

ALPHA
-5.000
0.000
5.000
10.000
20.000

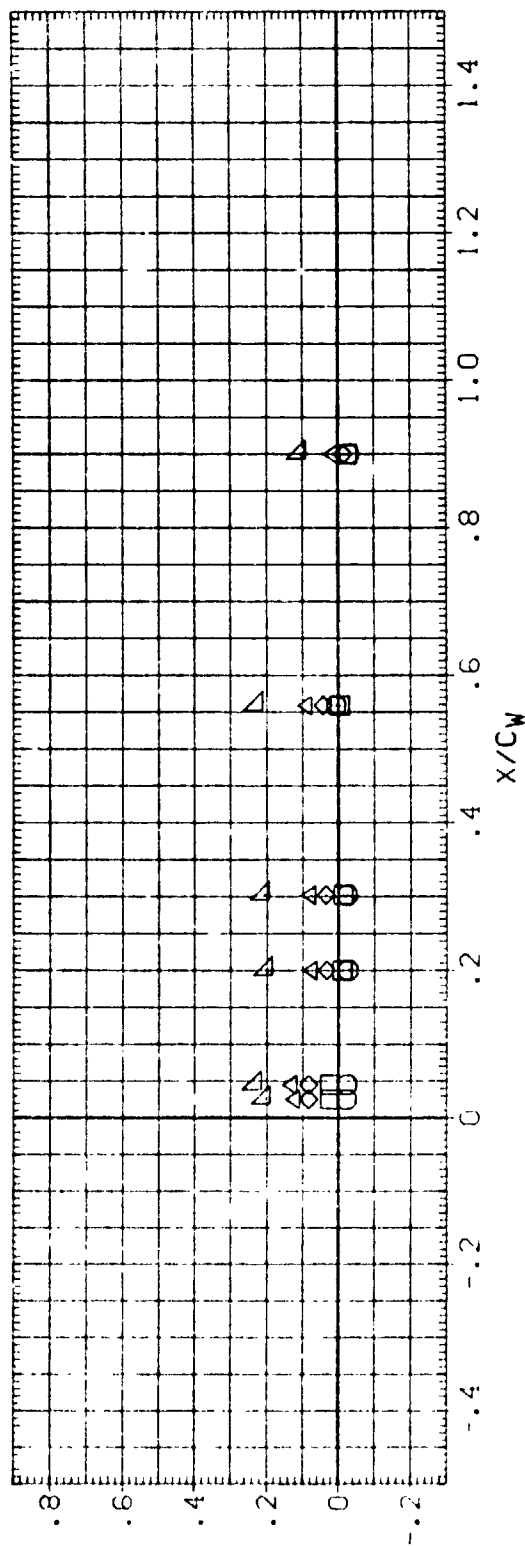
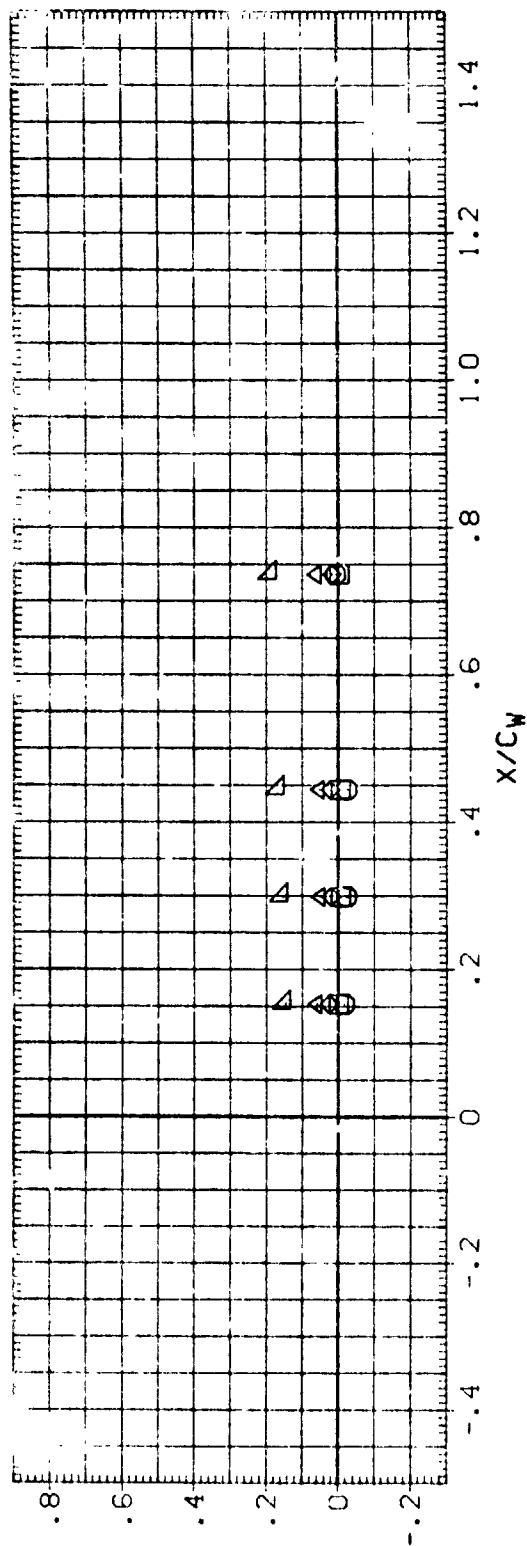


FIG. 45 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. LOWER WING.
BETA= 0, RN/L= 1.2

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(RQ3LCA) UPWT 1059 (IH4) 01 ALONE ORB. LOWER WING
 SYMBOAL ALPHA 2V/8V PACH RN/L PARAMETRIC VALUES
 -5.000 .600 .500 1.200 BETA .000
 5.000
 10.000
 20.000

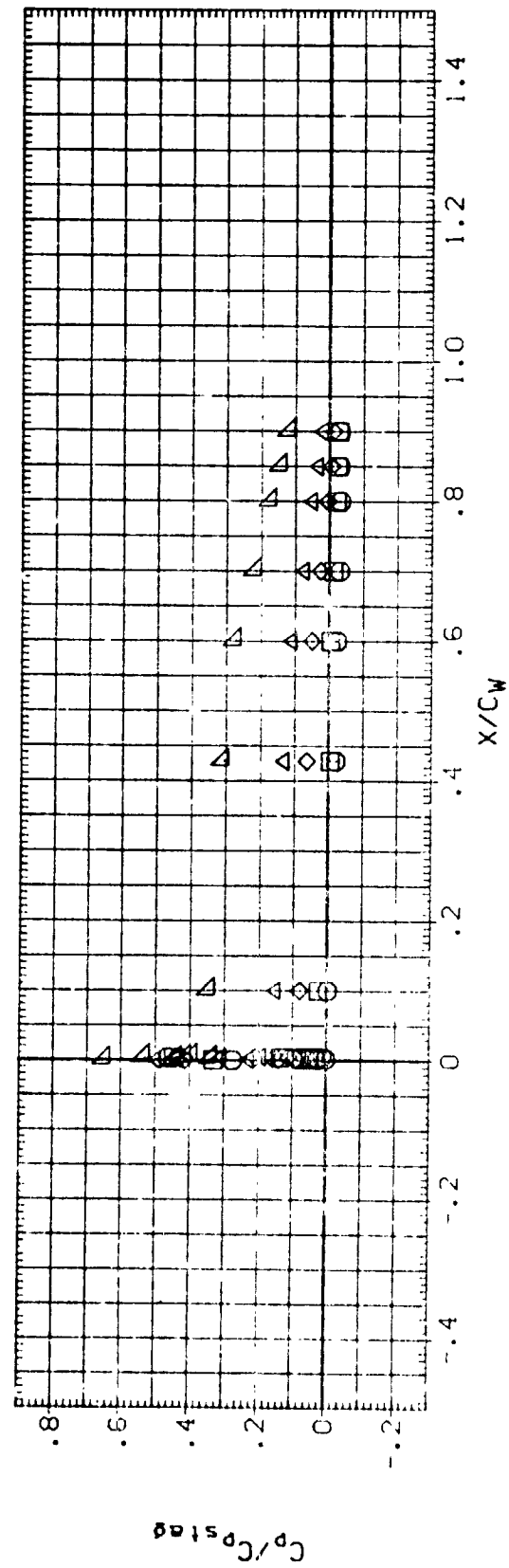
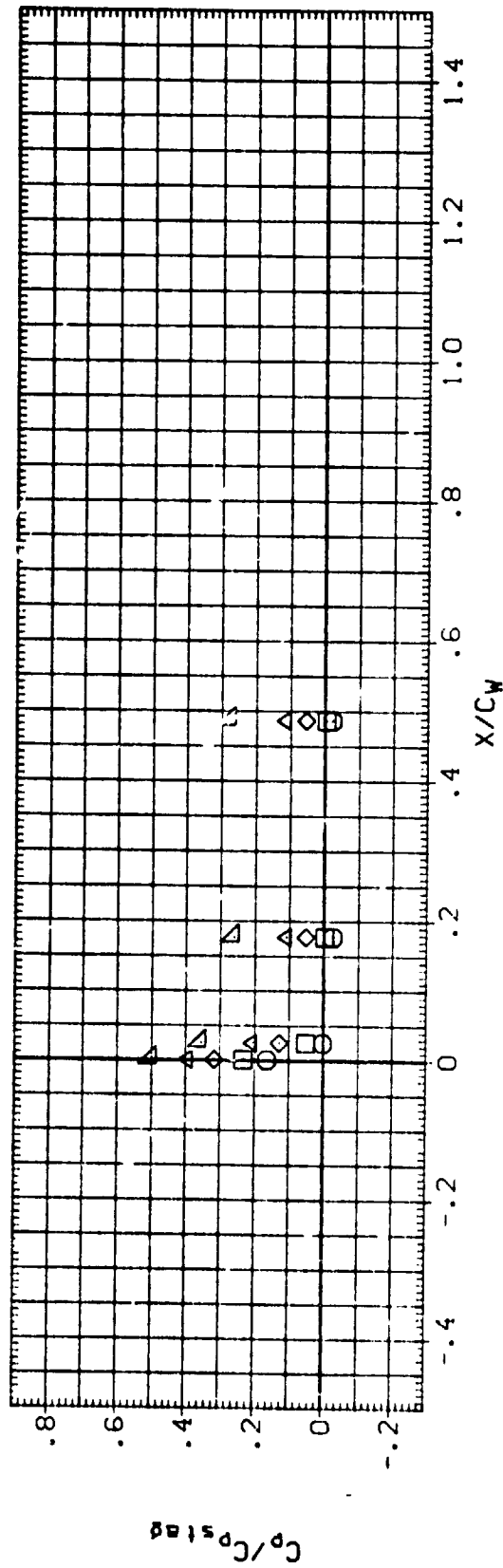


FIG. 45 VARIATION OF C_p/C_{ps} ON THE ISOLATED ORBITER, LOWER WING, BETA = 0. RN/L = 1.2

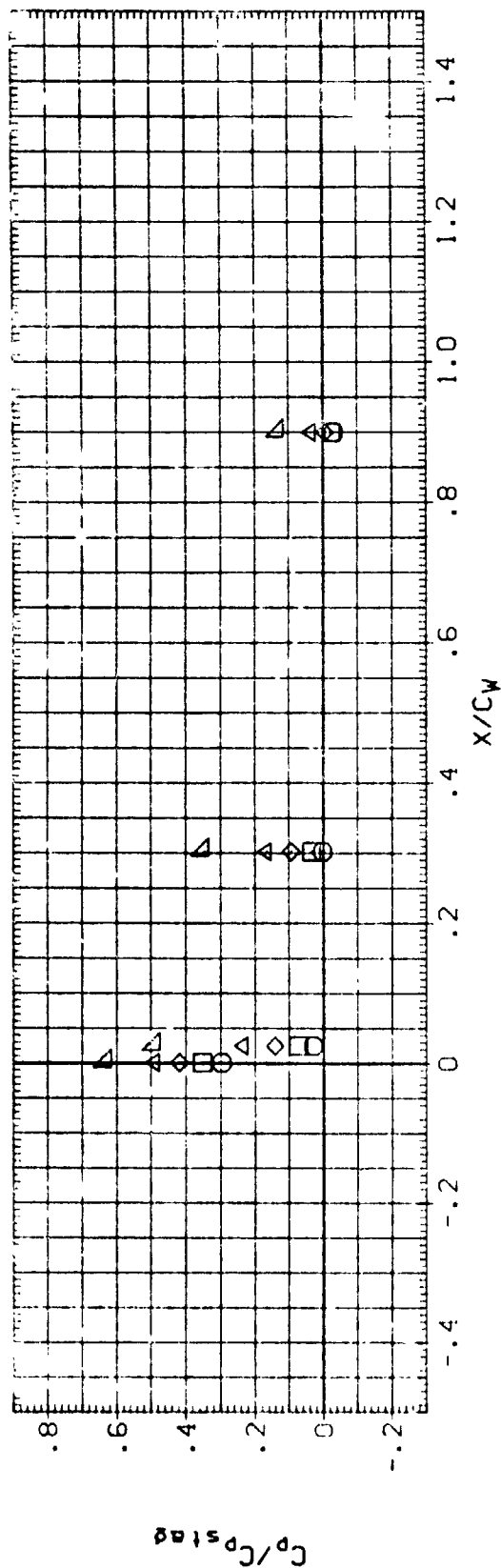
ORB. LOWER WING

UPWT 1059 (IH4) 01 ALONE

(RC3LCA) ALPHA 8.00
SYMBOL 3.700
-5.500
0.000
3.000
10.000
20.000

PARAMETRIC 1.200

RN



(R03LCA) UPWT 1059 (IH4) 01 ALONE ORB. LOWER WING

SYMBOL	ALPHA	2Y/BV	MACH	PARAMETRIC VALUES
	-5.000	.400	4.650	1.200 BETA .000
	5.000			
	10.000			
	20.000			

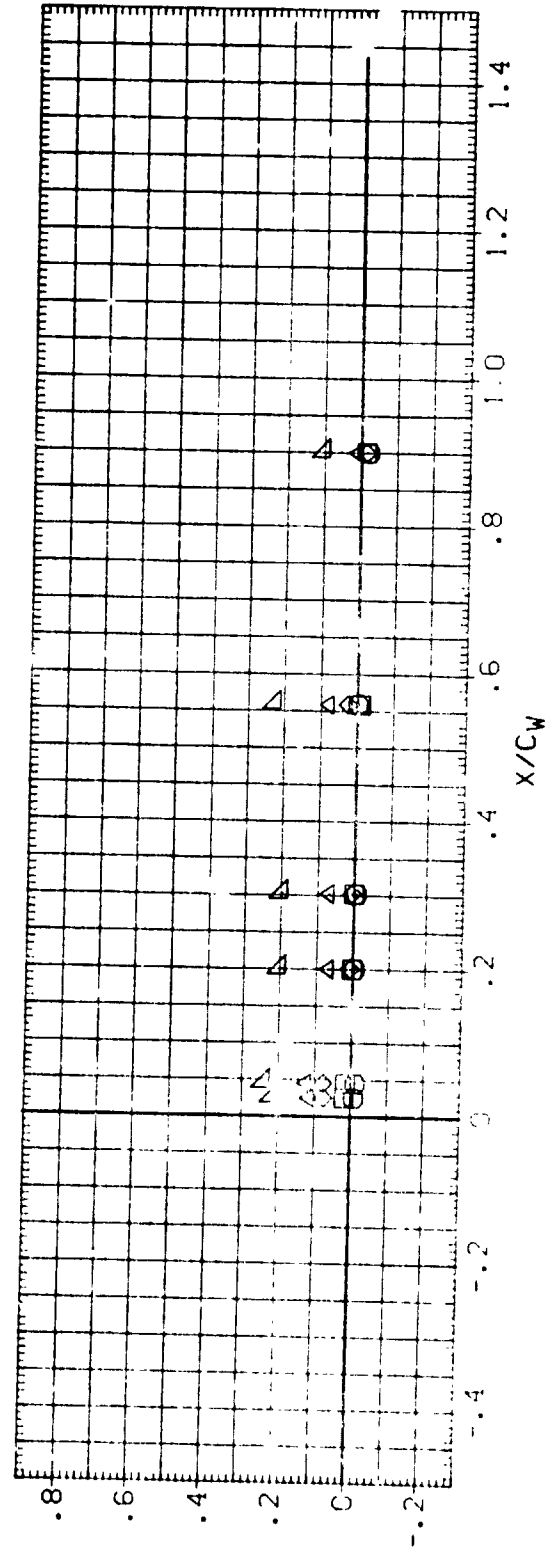
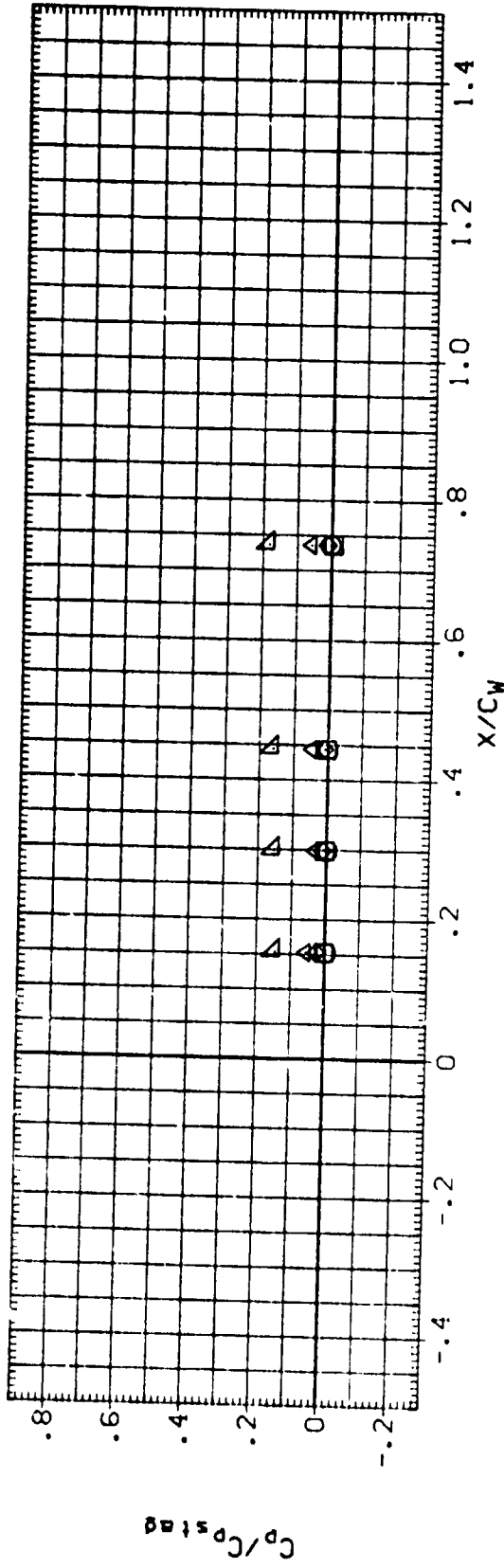


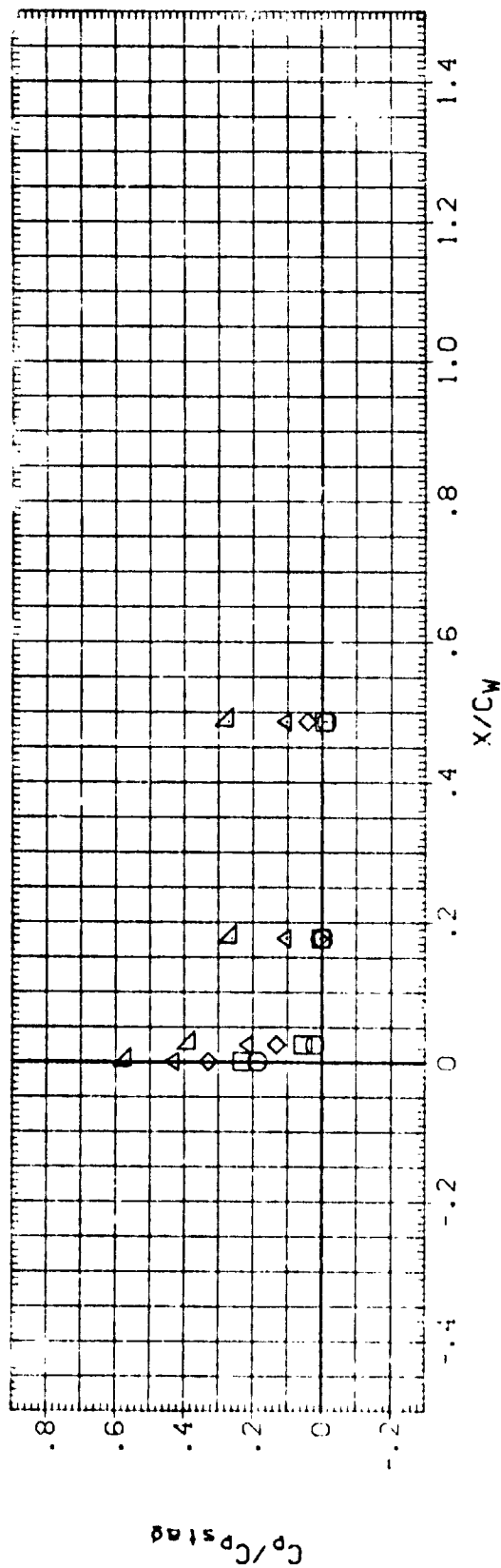
FIG. 45 VARIATION OF CP/CPs ON THE ISOLATED ORBITER. LOWER WING.
BETA = 0. RN/L = 1.2

ORB. LOWER WING

[RG3LCA] CPWT 1059 (IH4) 01 ALONE

SVF502 ALPHA 2V/84 MAC 4.600
 -5.000
 .000
 5.000
 10.000
 20.000

PN/L 1.200 BL 7



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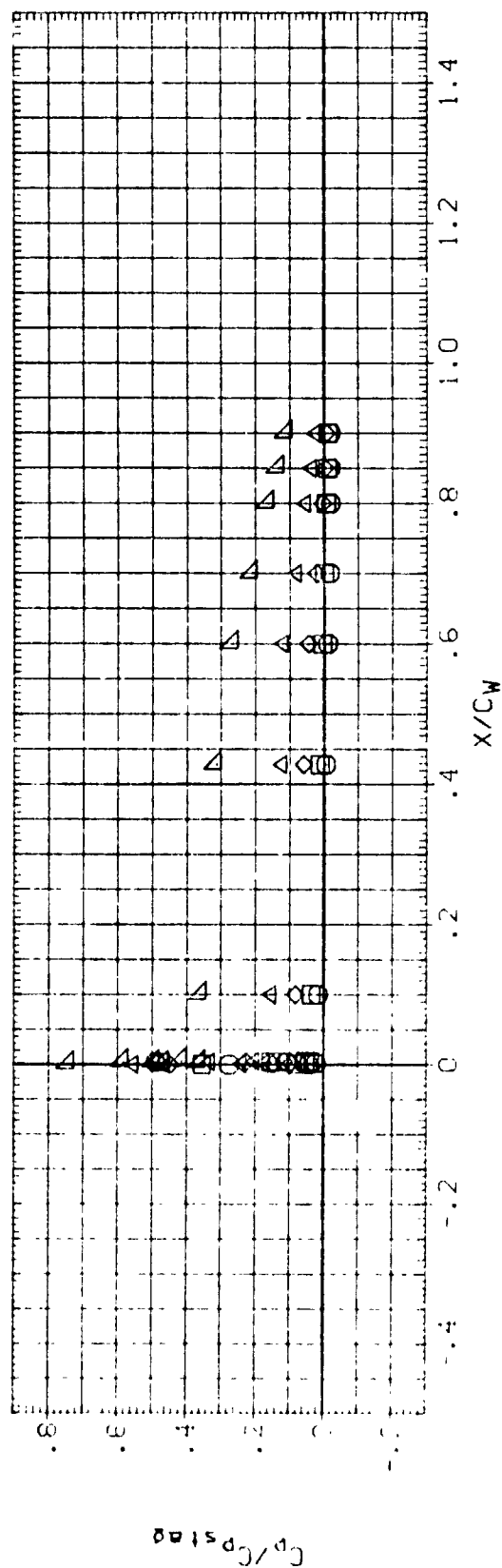


FIG. 45 VARIATION OF C_p/C_{ps} ON THE ISOLATED ORBITER. LOWER WING.
 BETA= 0. RN/L= 1.2

(R03LCA) UPWT 1059 (IH4) 01 ALONE ORB. LOWER WING

PARAMETRIC VALUES
RN/L 1.200 BETA .000

SYMBOL ALP-A 2V/BV MACH
-5.000 .850 4.600
-1.000 .750
5.000
10.000
20.000

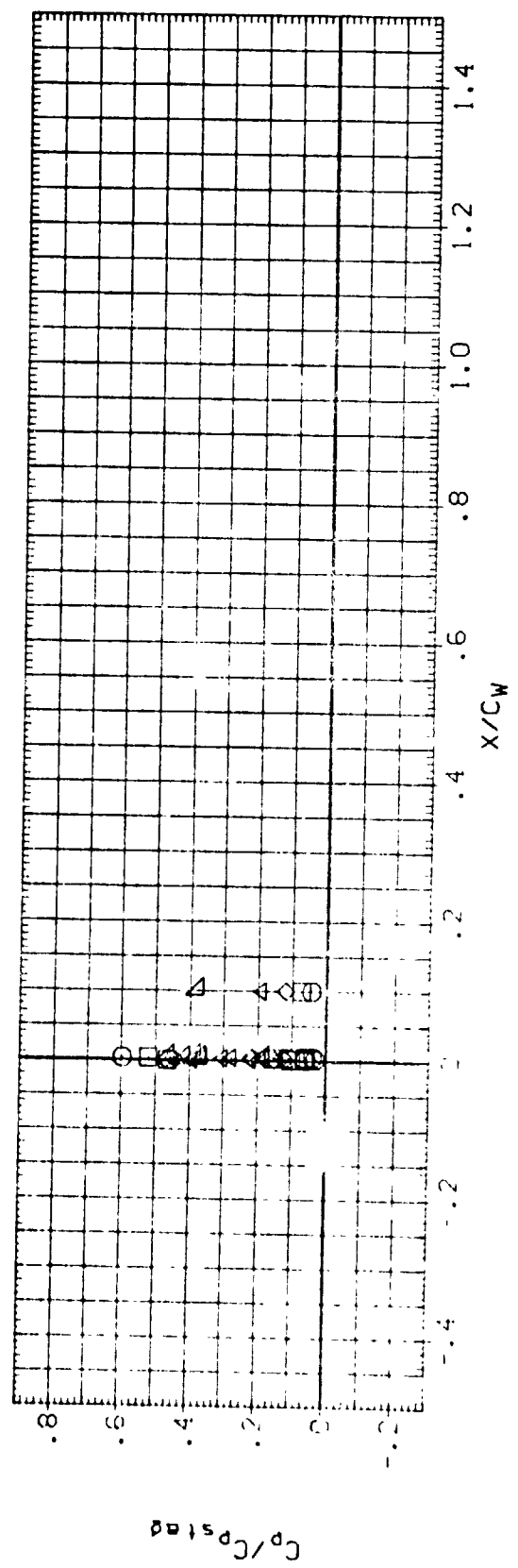
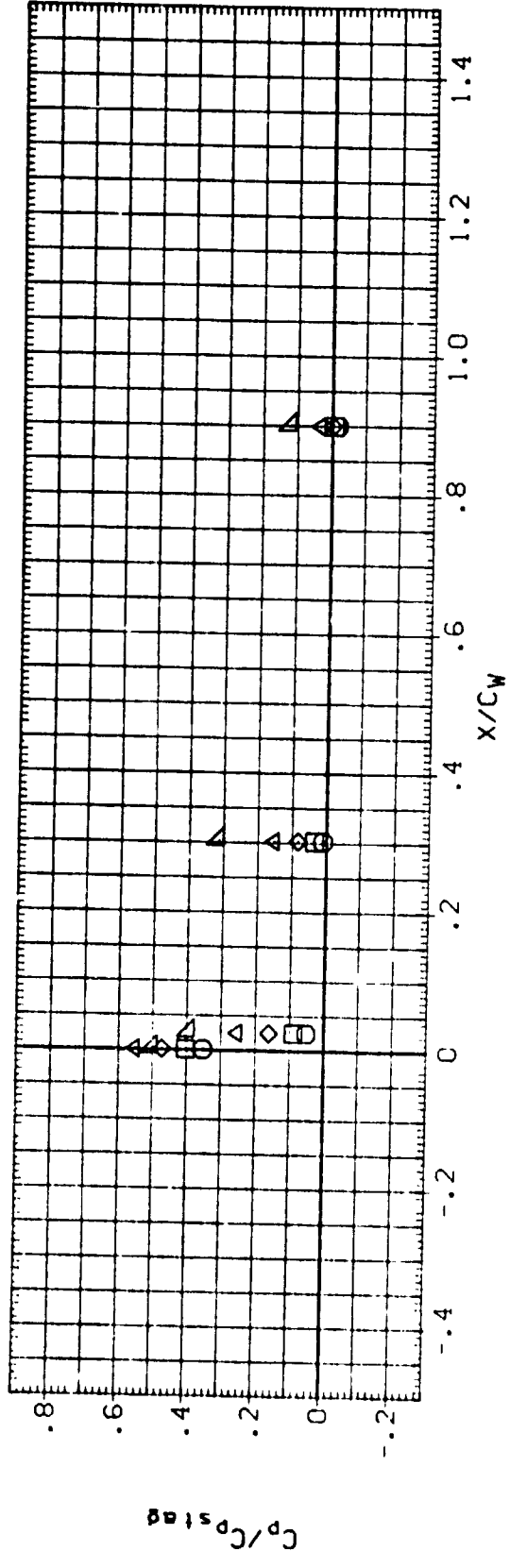


FIG. 45 VARIATION OF $C_p/C_{p_{stag}}$ ON THE ISOLATED ORBITER. LOWER WING.
BETA= 0. RN/L= 1.2

CRB. UPPER WING

UPWT 1059 (IH4) 01 ALONE

PARAMETRIC VALUES
RN/L 1.200 BETA .000

ALPHA 2.500
5.000
10.000
15.000
20.000

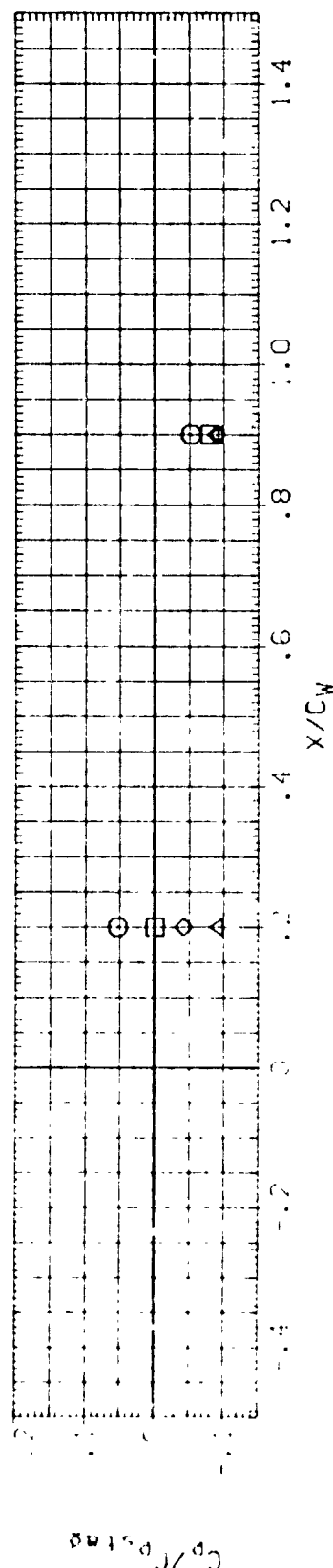
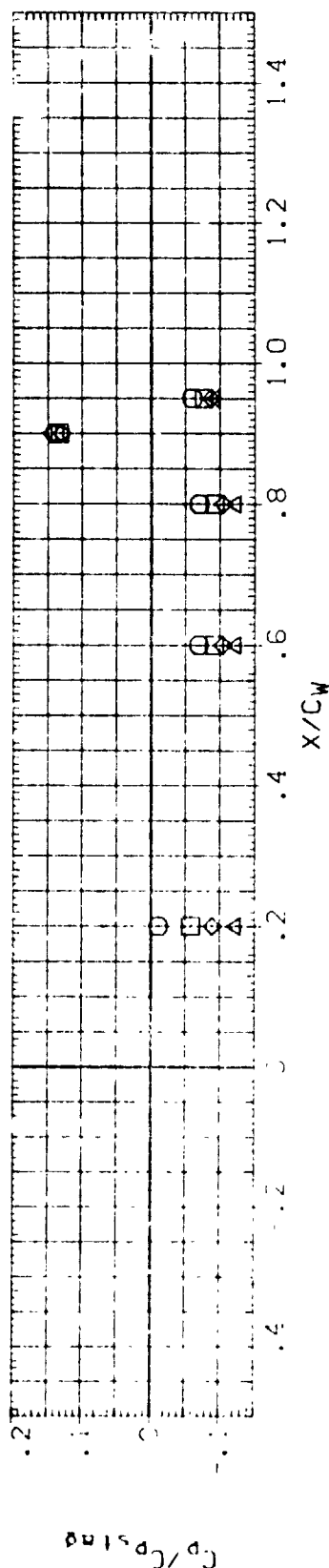
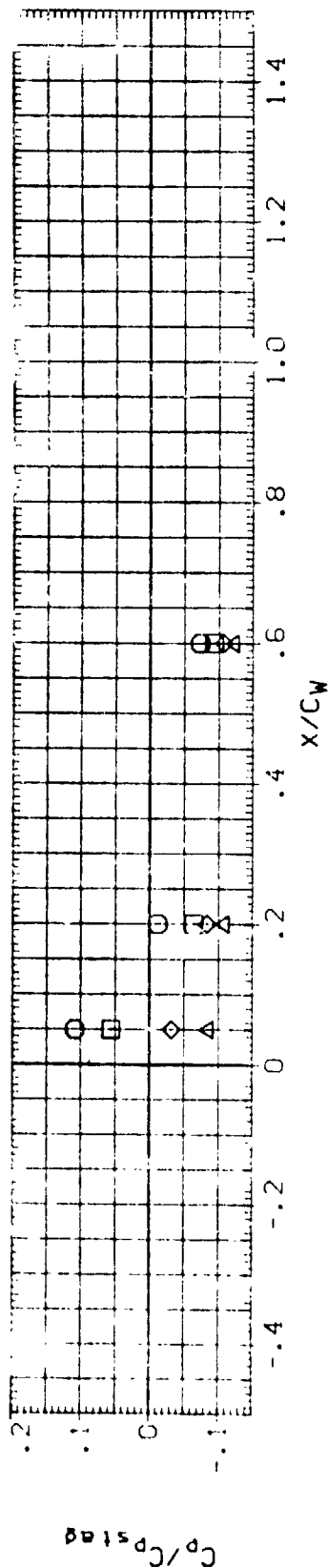


FIG. 46 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. UPPER WING.
BETA = 0. RN/L = 1.2

(RQ3UCA) UPWT 1053 (IH4) 01 ALONE ORB. UPPER WING

SYMBOL	ALPHA	2V/8V	MACH
X	.000	.800	2.950
	5.000	.600	
	10.000	.400	
	20.000		

PARAMETRIC VALUES
1.200 BETA .000

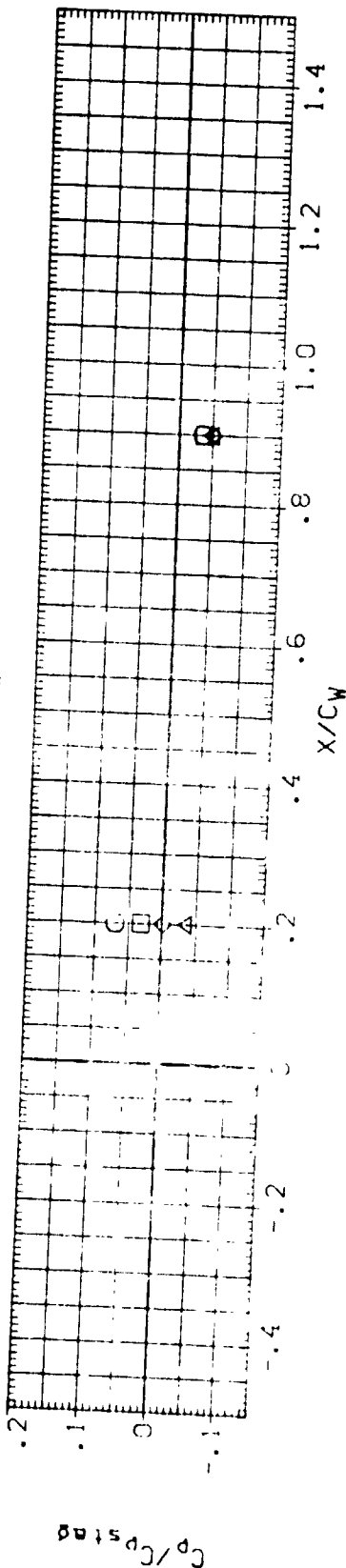
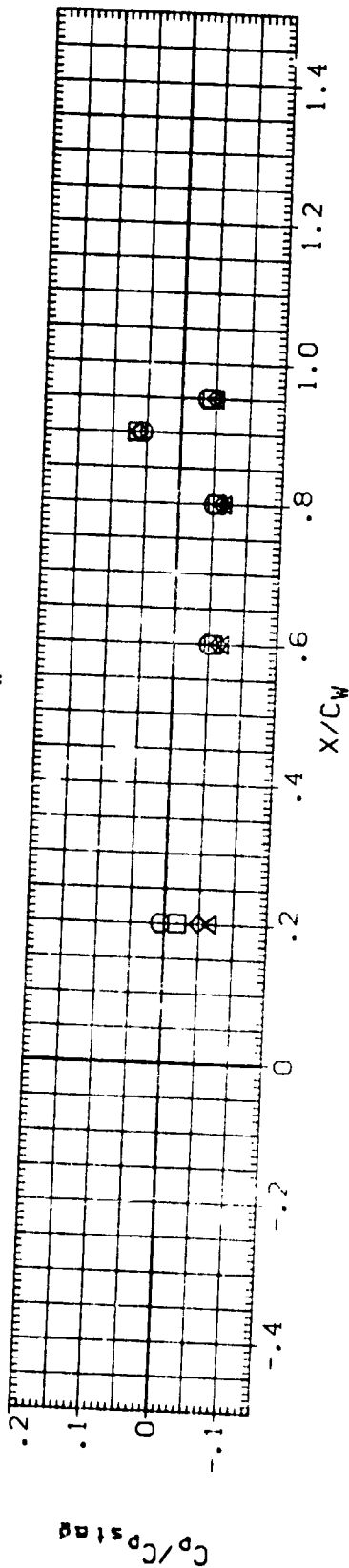
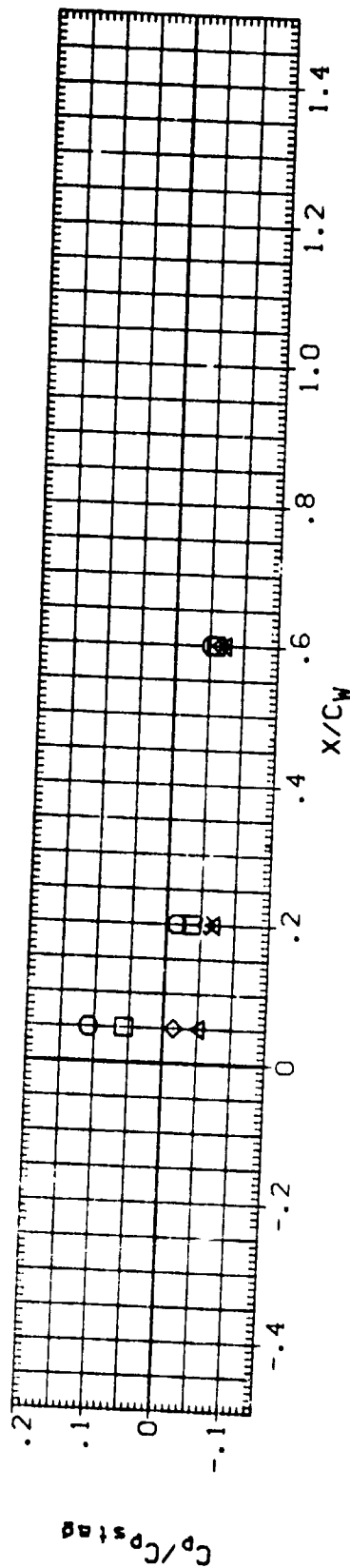


FIG. 46 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. UPPER WING.
BETA: 0. RN/L = 1.2

ORB. UPPER WING

UPWT 1053 (IH4) 01 ALONE

(PG3UCA) 5.000
2.700
3.700
-5.000
-800
-600
-400
5.000
10.000
20.000

PARAMETRIC VALUES
RN/L 1.200 BETA .000

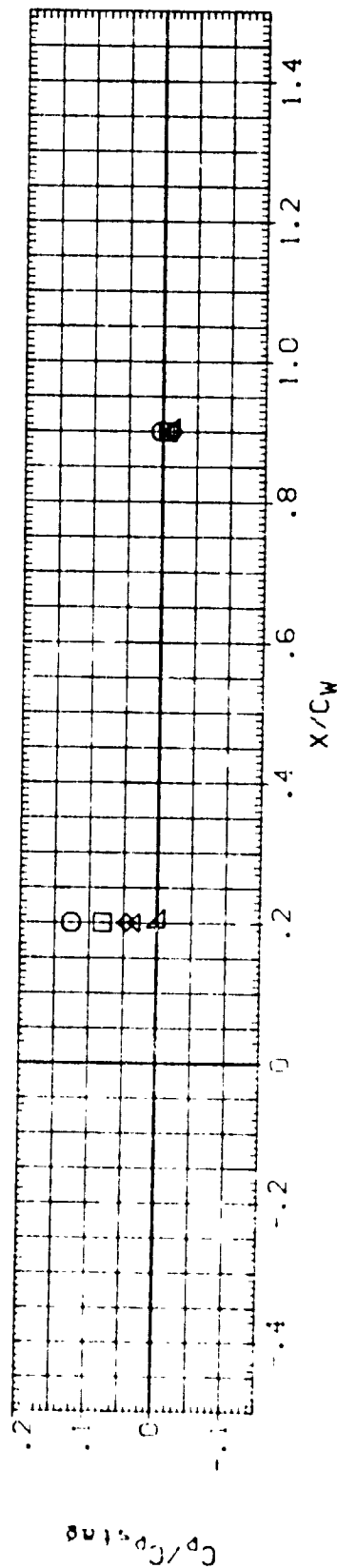
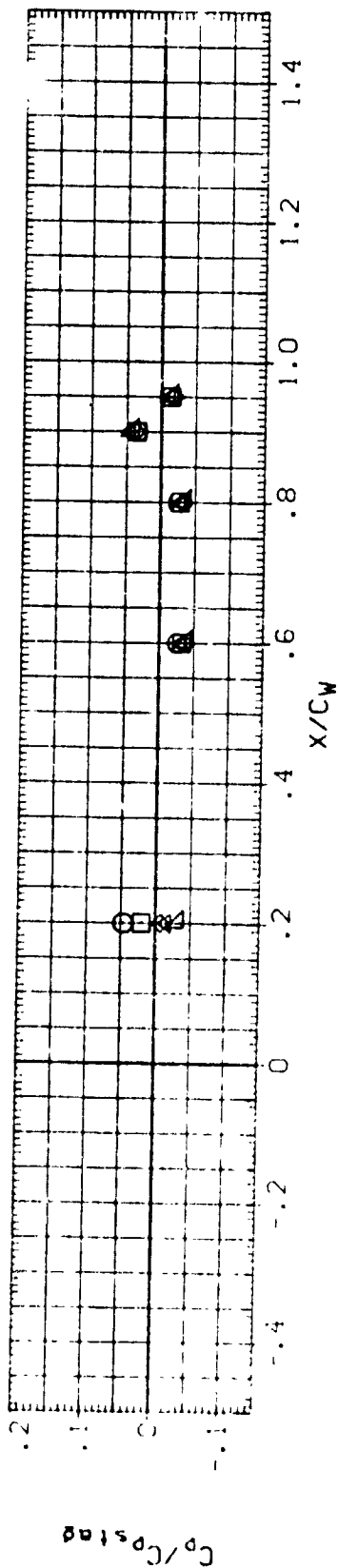
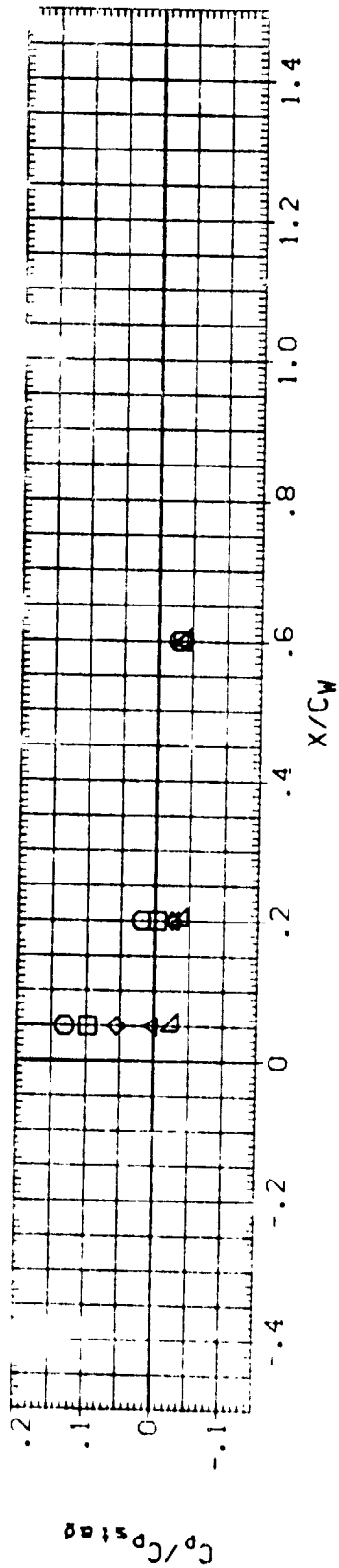


FIG. 46 VARIATION OF CP/CPS ON THE ISOLATED ORBITER, UPPER WING.
BETA= 0. RN/L= 1.2

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ORB. UPPER WING

UPWT 1053 (IH4) 01 ALONE

ALPHA
-5.000
-1.000
5.000
10.000
20.000

2Y/B.
.800
.600
.400

MACH
4.600

PARAMETRIC VALUES
1.200 BETA .000

RN/L

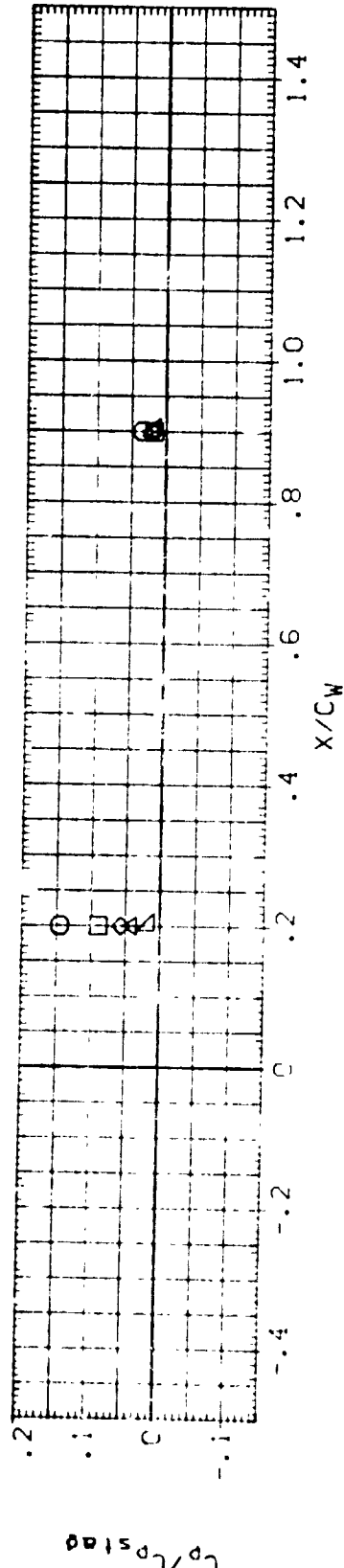
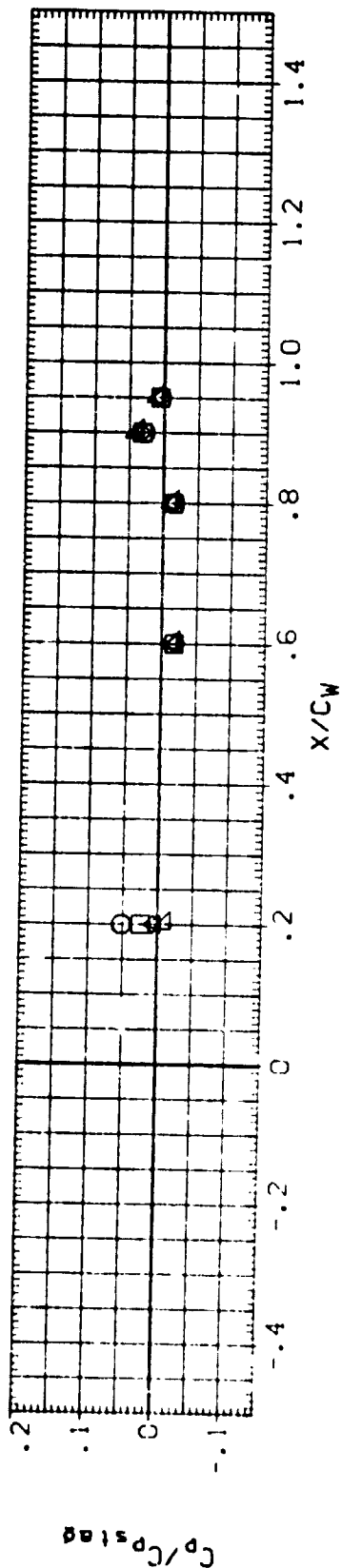
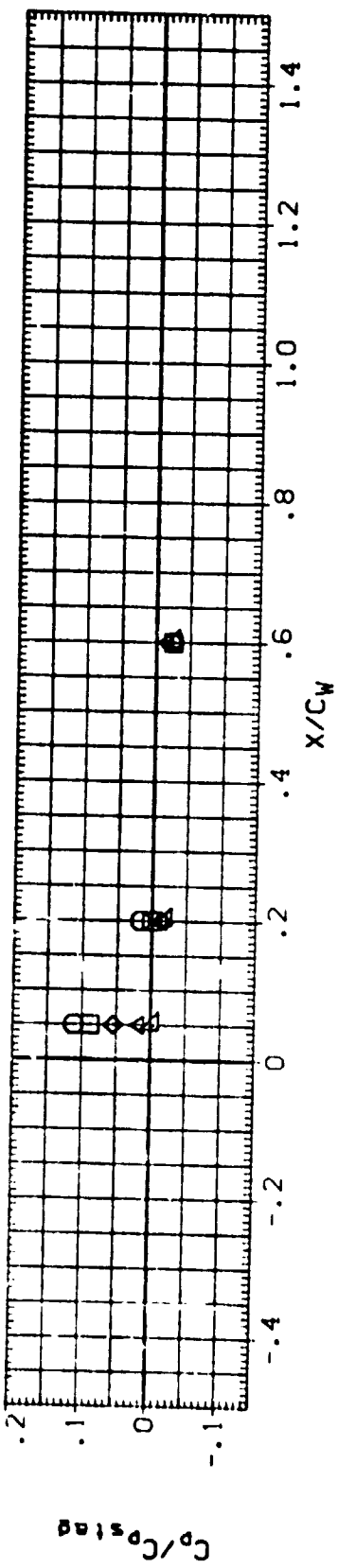


FIG. 46 VARIATION OF CP/CPS ON THE ISOLATED ORBITER, UPPER WING.
BETA= 0. RN/L= 1.2

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(R33VCA) UPWT 1059 (IH4) 01 ALONE ORB. VERT. TAIL
SYMBOL ALPHA Z/8V MAC_R RN/L BETA .000
.000 .299 2.360
5.000 .532
10.000 .765
20.000

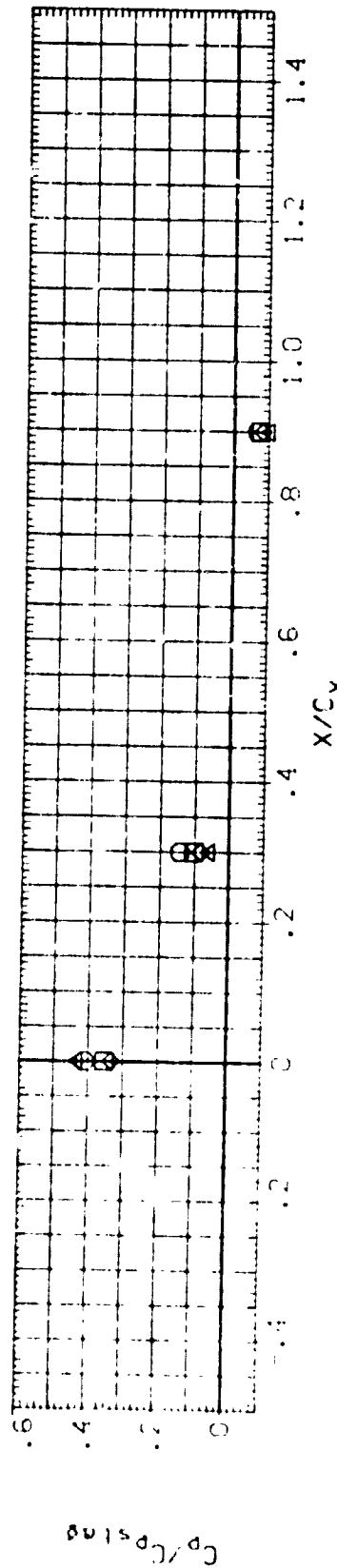
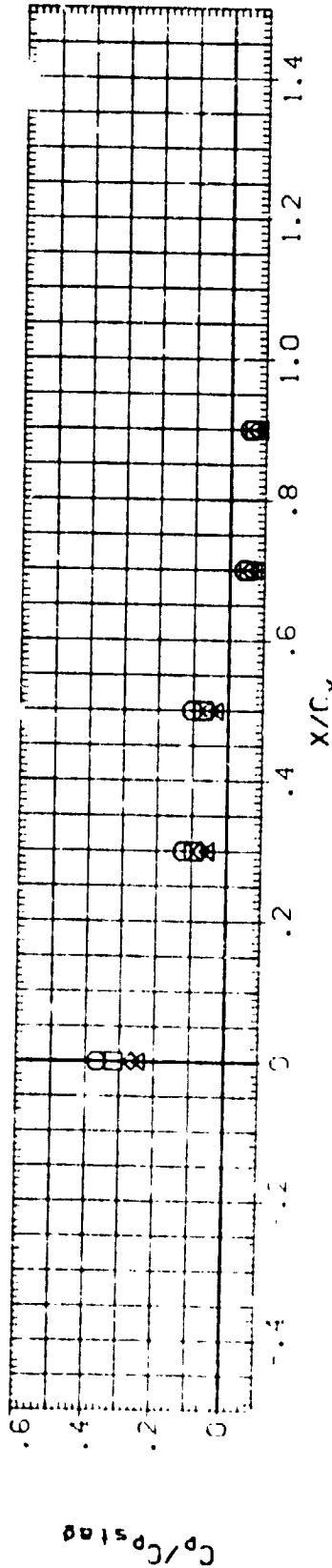
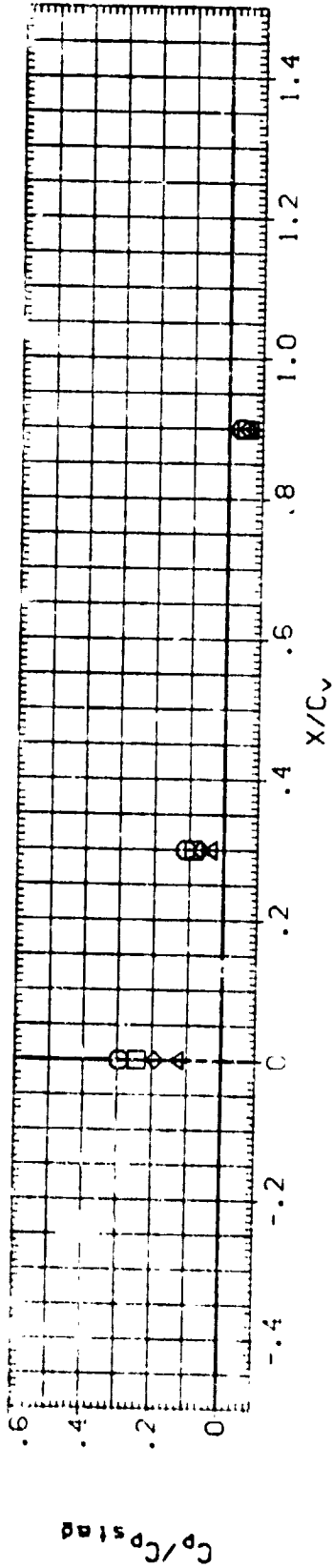


FIG. 47 VARIATION OF CP/CPS ON THE ISOLATED ORBITER, VERTICAL TAIL,
BETA = 0, RN/L = 1.2

(R03VCA) CPWT 1059 (IH4) 01 ALONE ORB. VERT. TAIL

SYMBOL	ALPHA	Z/B	MACH	RV/L	PARAMETRIC VALUES
	.000	.299	2.950		1.200 BETA
	5.000	.532			.000
	10.000	.765			
	20.000				

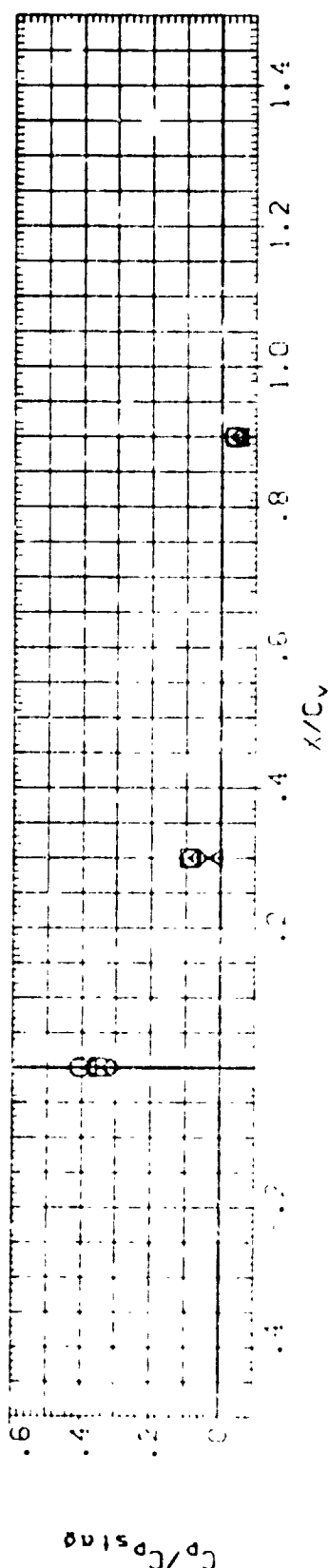
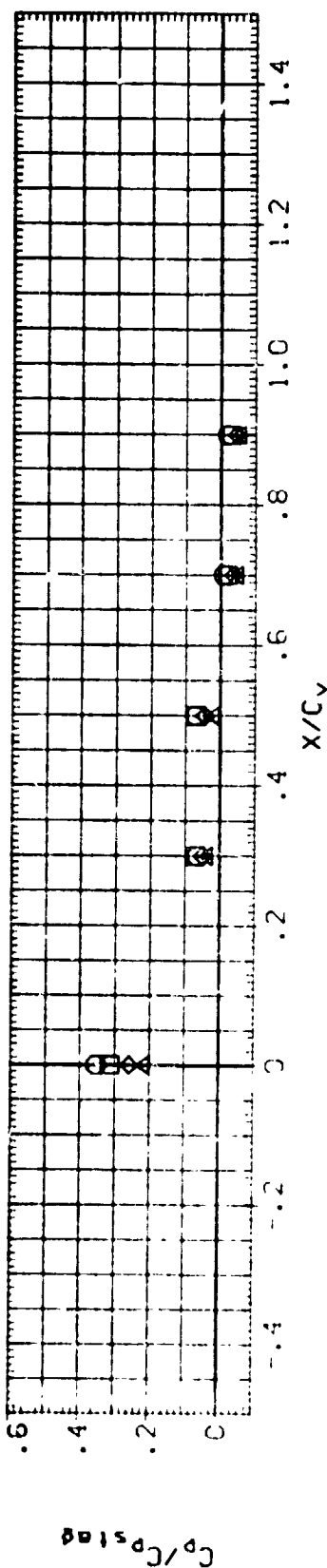
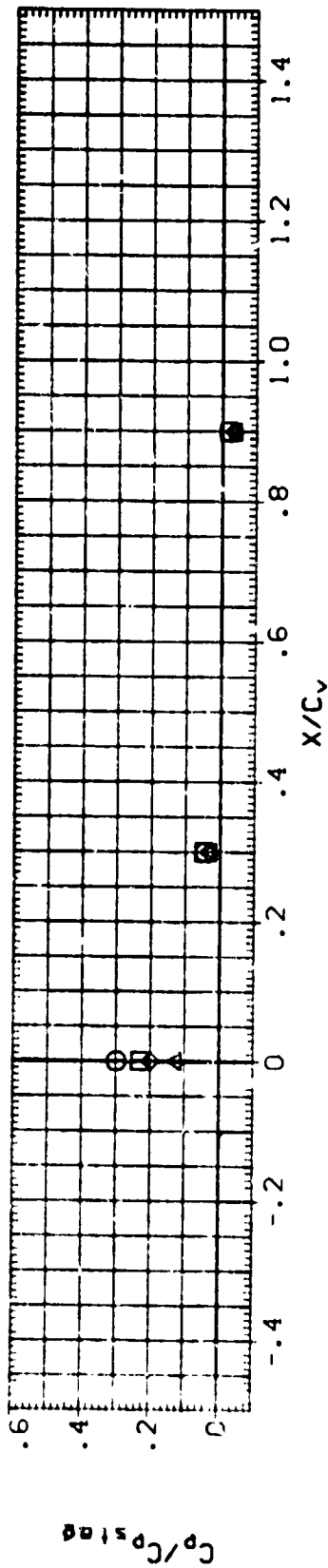


FIG. 47 VARIATION OF CP/CPSLAB ON THE ISOLATED ORBITER, VERTICAL TAIL.
BETA = 0, RV/L = 1.2

ORB. VERT. TAIL

UPWT 1059 (IH4) 01 ALONE

(PG3/CA) ALPHA
5.000
5.000
5.000
5.000
5.000

Z/BV
289
132
132

MACH
3.700

PAPILTRIC VALUES
1.200 BETA

RN/L

0.00

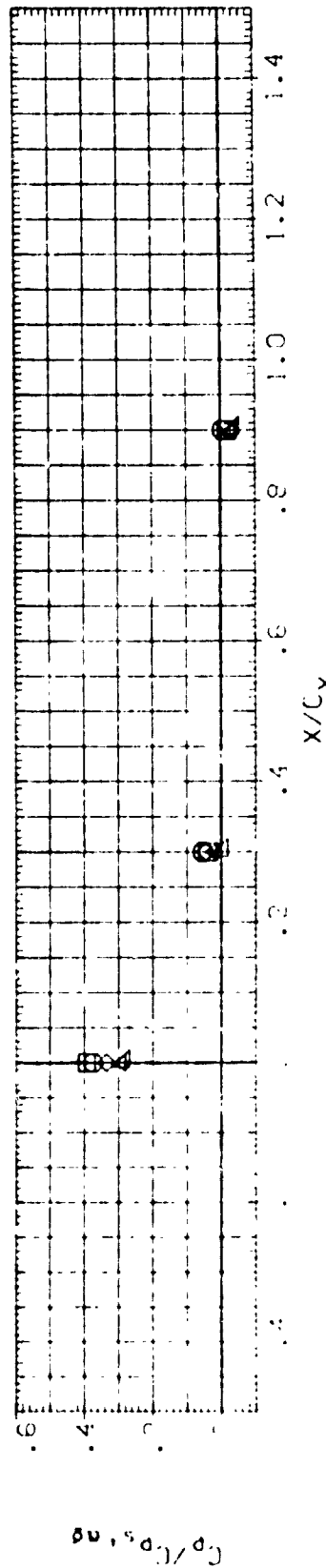
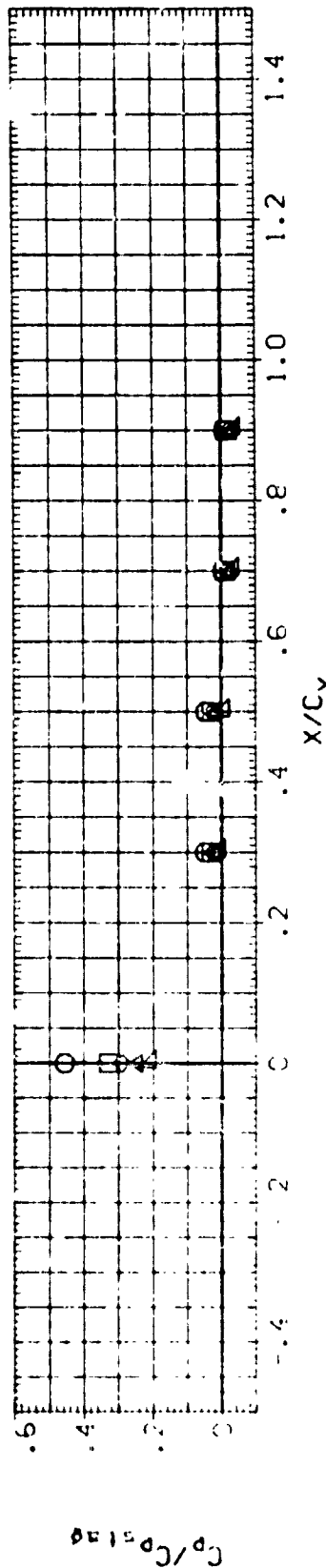
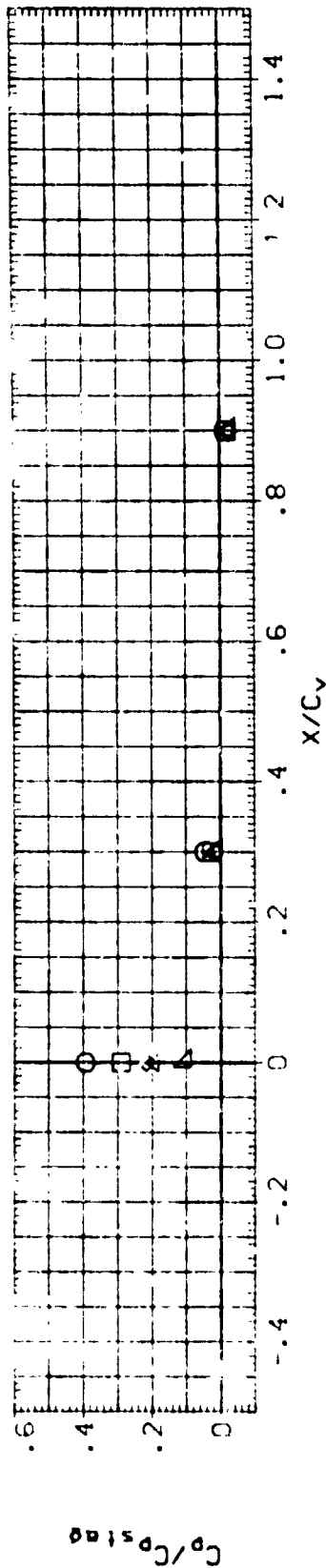


FIG. 47 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. VERTICAL TAIL.
BETA = 0, RN/L = 1.2

ORB. VERT. TAIL

UPWT 1059 (IH4) 01 ALONE

[R03VCA]

PARAMETRIC VALUES
1.200 BETA .000

MACH 4.600

Z/BV
.299
.532
.765

ALPHA
-5.000
.000
.532
5.000
10.000
20.000

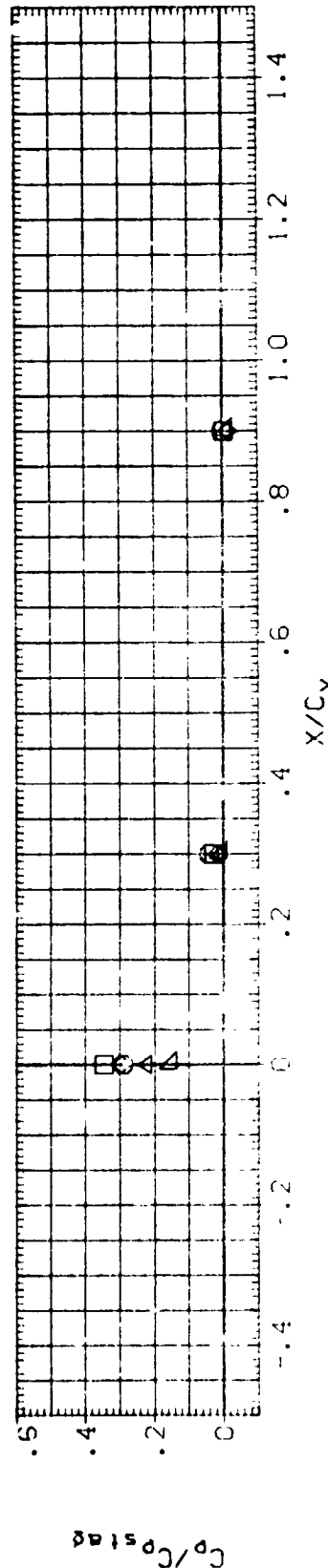
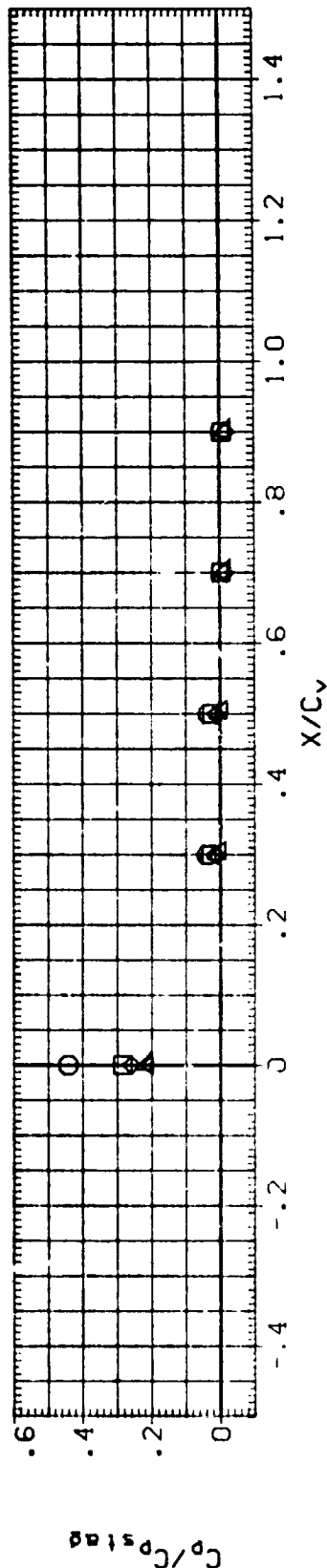
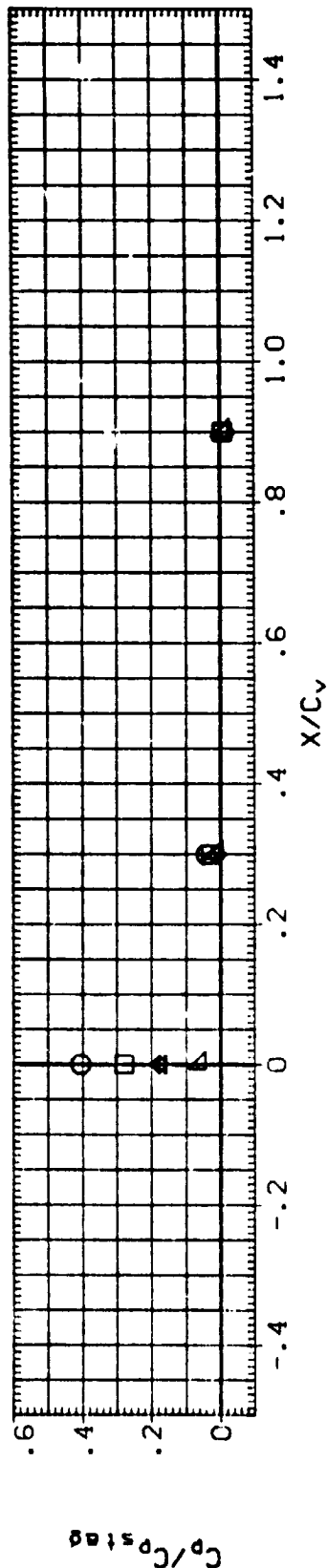


FIG. 47 VARIATION OF CP/CPS ON THE ISOLATED ORBITER. VERTICAL TAIL.
BETA= 0. RN/L= 1.2